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Electric refrigeration news

THE NEWSPAPER OF THE INDUSTRY

AIR CONDITIONING AND

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REFRIGERATION NEWS

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Trade-ins Raise Questions under N.Y. Price Law

'Fixed Percentage' vs. 'Reasonable Allowance' Advocates Battle

NEW YORK CITY—Whether the trade-in allowance section of distributor-dealer price maintenance contracts under New York State's Feld-Crawford fair trade act should specify a "fixed maximum percentage" or be limited to recommending a "reasonable allowance" became the subject of considerable controversy in this territory last week.

The controversy arose after Senator A. Spencer Feld, co-author of the Feld-Crawford act, in a letter to D. W. May, district radio sales manager of General Electric Co., had expressed the opinion that the "reasonable allowance" provision was the best way of meeting the situation, and that the "fixed maximum" ruling would not be sanctioned by the courts.

This interpretation by a legislator of a state fair trade act is considered significant in some quarters as establishing a precedent which may be followed in setting up price control contracts in the 40 other states which have fair trade legislation.

"There is no way in which anyone can tell in advance the value of a set to be taken in for a trade-in allowance, and the only possible way to accomplish this and keep within the law is to provide for a reasonable value on the old set," Senator Feld said in his letter to the General Electric radio sales manager.

"To permit a pre-determined value on an old set for trade-in allowance would be equivalent to nullifying the provisions of the Feld-Crawford Act and would not, in my opinion, be sanctioned by the courts.

"Any allowance based solely on a percentage basis of the list price of the new set would be equivalent, in my opinion, to the giving of an

(Concluded on Page 3, Column 1)

G-E Pre-Views 1938 Line Nov. 1

CLEVELAND — General Electric Co.'s distributor preview of its 1938 line of major household appliances will be held at Nela Park during the week of Nov. 1, distributors were informed last week in a letter from A. M. Sweeney, manager of the sales division of the company's appliance and merchandise department.

The early November factory preview will enable distributors to start their dealer pre-showings before Nov. 10, Mr. Sweeney's letter said. The 1938 G-E major appliance line will be released to dealers on Dec. 1, same date on which the 1937 line was put on the market.

This will give dealers ample time to capitalize on Christmas business, appliance department officials believe.

Stewart-Warner Shows 2 Advance 1938 Models

CHICAGO — Two special advance models in its 1938 electric refrigerator series were introduced by Stewart-Warner Corp. to distributors and dealers at the company's recent radio convention here.

The models, of 5 and 6-cu. ft. storage capacities, have the regular Stewart-Warner "vapor-sealed" cabinets, interiors of porcelain enamel, and exteriors of high-bake Du Pont Dulux, but otherwise are without the "Sav-A-Step" and other features which the company included in its 1937 refrigerator line.

(Concluded on Page 20, Column 5)

Cordiner Named Manager of G-E Appliance Sales

RALPH J. CORDINER

* * *

BRIDGEPORT, Conn.—Ralph J. Cordiner, assistant manager of the appliance and merchandise department of the General Electric Co., on Sept. 1 assumed the additional duties of general manager of appliance sales.

The announcement was made by Vice President Charles E. Wilson simultaneously with the announcement that P. B. Zimmerman, who had been in charge of appliance sales, had resigned to accept an executive position with the Norge division of Borg-Warner Corp.

Mr. Cordiner is one of the youngest men in the electrical appliance industry to hold an executive sales position, but he has had broad experience in appliance selling.

After 10 years with the Edison General Electric Appliance Co. on the Pacific coast, Mr. Cordiner came to Bridgeport in 1932 as manager of the heating device section. Two years later, when the radio division was formed, he was placed in charge; and early this year was named assistant manager of the appliance and merchandise department.

Wholesale Radio Signs Feld-Crawford Contract

BROOKLYN — Wholesale Radio Equipment Co., distributor of Stewart-Warner refrigerators and radios, has signed agreements with its dealers under the Feld-Crawford fair trade act. Agreements include fixed maximum trade-in allowances on products sold by the company.

Wholesale Radio is the third refrigerator distributor to sign a fair trade act agreement with dealers.

Shorter Terms On Time Sales Believed Near

Finance Company Group Official Outlines Probable Changes

CHICAGO—The movement toward strengthening instalment credit terms which has been manifested during recent months in the automobile trade is now being duplicated in the appliance field, according to John R. Walker, executive vice president of the National Association of Sales Finance Companies.

"The first important financing agency to announce a shortening of instalment terms on purchase contracts covering mechanical refrigerators and household appliances was the Bank of America, which operates throughout the state of California," stated Mr. Walker.

"During the past week, one after another of the large national finance companies, as well as numerous regional and local companies, have announced similar action, or the intention of taking similar action in the immediate future.

"It may be stated definitely that by Sept. 1, C.I.T., Commercial Credit, GMAC, ReDisCo, and General Electric Contracts Corp. will have fallen into line with the movement," he declared.

Terms on mechanical refrigerators, ranges, and water heaters are being shortened from a maximum of 36

(Concluded on Page 2, Column 3)

Food Preservation by Refrigeration to Be Conference Subject

CAMBRIDGE, Mass.—Food preservation by refrigeration is the general subject of the 11 talks scheduled for the third day of the Food Technology Conference which will be held at the Massachusetts Institute of Technology here Sept. 14-17.

During the morning session of the third meeting, at which Gardner Poole, vice president of American Society of Refrigerating Engineers, will preside, the following speakers will address the conference:

Dr. Rudolph Plank, director of the Kaltetechnisches Institut, Technische Hochschule, Karlsruhe, Germany—"Some Recent Advances in the Science and Technology of Food Refrigeration."

Dr. A. K. Balls and H. Lineweaver, bureau of food research, U. S. De-

(Concluded on Page 20, Column 2)

Zimmerman Joins Norge to Head Sales Activity

P. B. ZIMMERMAN

* * *

DETROIT—P. B. Zimmerman has been appointed vice president in charge of sales for the Norge division of Borg-Warner Corp., effective Sept. 1.

John Knapp, formerly vice president in charge of sales, has been named executive vice president of the Norge division of Borg-Warner Corp. and will work directly with President Howard E. Blood in the direction of the division's activities.

Mr. Zimmerman resigned the position of general manager of appliance sales of the appliance and merchandise department of General Electric Co. to accept the Norge vice presidency.

"Zim," as he is known to his friends in the refrigeration industry, was appointed sales manager of the electric refrigeration department of General Electric Co. when the department was formed in 1925.

He and T. K. Quinn staged the merchandising and promotional campaigns that made the G-E "Monitor Top" a nationally known trademark, and brought General Electric to a recognized place among the leaders of the household electric refrigeration industry within a very few years. When G-E in recent years began to combine its major appliance divisions he became manager of all specialty appliance sales.

Mr. Zimmerman has been active in cooperative sales and advertising movements, taking a leading role in the first N.E.L.A. electric refrigeration campaign, and the Food Preservation campaign of 1929.

Berkeley Heads Tri-State District for Leonard

DETROIT — Appointment of Elwood R. Berkeley as district manager of Leonard distributors in Michigan, Ohio, and Indiana has been announced by R. I. Petrie, sales manager for Leonard division, Nash-Kelvinator Corp.

Before joining the Leonard organization a year ago as head of the merchandising division, Mr. Berkeley was for five years merchandising manager of electrical appliances with the Hecht Co., Washington, D. C. department store.

While with the Hecht Co., Mr. Berkeley's department sold more than 3,000 refrigerators in one year.

In his new position, Mr. Berkeley will contact Leonard refrigerator distributors in Detroit, his headquarters, Grand Rapids, Toledo, South Bend, Fort Wayne, Columbus, and Cleveland.

C.R.M.A. Plans 'Blue Book' on Obsolete Units

Move Designed to Halt Trade-in Overvaluation; Shorter Terms Praised

CHICAGO — In two significant moves, members of the Commercial Refrigerator Manufacturers Association at their annual meeting here Aug. 9 and 10 voted support of the movement toward shorter time payment terms, and adopted a plan designed to discourage excessive trade-in allowances on used commercial equipment.

Under the trade-in plan, manufacturer-members of the association will list with headquarters here all discontinued models, together with an estimate of their fair appraised values. This data will then be published in "blue book" form, and made available to all distribution agencies as a guide in making fair trade-in allowances.

Move to support the finance companies on the stand they have taken regarding the time payment question followed a discussion of the association's work in educating the industry to the evils of the "easy payment" policy, and a report by R. E.

(Concluded on Page 2, Column 1)

Free Goods Must Not Injure Competitors, Calif. Official Rules

SACRAMENTO, Calif. — Giving away merchandise for the purpose of injuring competitors or destroying competition violates the amended California unfair trade practices act, according to a ruling of Attorney General U. S. Webb.

The 1937 amendment to the act eliminates the prohibition against the offering and advertising of goods below cost, but does not permit a merchant to engage in practice injurious to his competitors, Mr. Webb declared.

The attorney general expressed his opinion on the act in answer to the following letter from assemblyman Melvin I. Cronin, San Francisco attorney:

"In my legislative capacity there has been presented to me the question of whether or not the following proposition is contrary to the fair trade act, the unfair trade practices act, or to law generally:

"A merchant advertises the following: That he will give away to all persons who were in his store on a certain date a certain amount of merchandise. The date is selected as the lowest cash sales day for the

(Concluded on Page 3, Column 3)

Household Sales Records Again Smashed as July Figures Push Total over 2,000,000 in 7 Months

DETROIT — World manufacturer-to-distributor sales of household electric refrigerators for the first seven months of the year totaled 2,035,600 units, according to estimates by AIR CONDITIONING AND REFRIGERATION NEWS. This is the first time in the history of the industry that the 2,000,000-unit mark has been passed so early in the year.

World household sales for the month of July alone totaled 206,500 units, the NEWS estimates.

The record seven-month figure showed an increase of nearly 15% over the 1,738,100 units sold during the first seven months of 1936. Last year the 2,000,000-unit mark was not passed until late in October.

Although July sales this year dropped 15,000 units below sales for July, 1936, they were still well ahead of sales recorded during any other previous July.

Household electric refrigerator sales reported for the seven-month period this year by the 15 member companies of the Household Refrigeration Section of the Refrigeration Division of National Electrical Manufacturers Association totaled 1,902,742 units. Nema reports for household refrigerator sales during July totaled 192,052 units.

By far the most popular size in the domestic market for July was the 6-cu. ft. box, while Canadian and other foreign sales indicated a strong preference for the 4-cu. ft. lacquer and 5-cu. ft. porcelain cabinets.

New York easily retained its grip on first position in the tabulation of sales by states with a total of 22,246 units for July, and Pennsylvania kept in second position with 17,978 units. Sales to California and Illinois went over 12,000 units, while Ohio and Michigan followed closely in the 11,000-unit bracket.

July Sales by ACMA Show 52% Increase

WASHINGTON, D. C. — Installed cost of equipment sold by members of Air Conditioning Manufacturers Association during July totaled $7,508,778, an increase of 52.1% over the amount reported for the same month in 1936, industry headquarters announces.

Continuation of hot weather is keeping room cooler sales at unprecedented high levels, it was reported.

Sales in July were greater than for any month last year, and brought this year's total to $68,306,175, a mark 37% higher than the volume for all of 1936.

Highest monthly mark this year was set in March, when ACMA sales totaled $17,137,869. Sales during all of 1936 by association members amounted to $49,942,301.

Kelvinator's Advertising and Sales Promotion Staff Relaxes at a Stag Picnic

Recently the entire advertising and sales promotion departments of Kelvinator division, Nash-Kelvinator Corp., got together for a stag picnic. One of the many camera "fans" in the department took these fine informal pictures at the outing. In the pictures from left to right we have (1) Ralph Hunter, manager of displays (center), exhausted from his heroic efforts in the ball game, being supported from the field by Walt Jeffrey (left), Leonard advertising manager, and Sam Mitchell, director of all Kelvinator advertising and sales promotion; (2) Bill Saylor, sales promotion manager, demonstrates his versatility by playing a harmonica without use of his hands; (3) Fred Worden, who handles commercial sales promotion, in a serious mood, despite the hubbub of the ball game behind him; (4) all set for lunch are Lyle Schultz of the cooperative advertising division and J. T. Steinko, copy chief; (5) "let the rest of those guys get hot and dusty playing ball" say Gerald Lapiner of the copy department, and John Boyd of the Geyer, Cornell & Newell advertising agency, as they find a bit of shade in which to take it easy.

J. W. Holcomb Heads Commercial Case Maker's Group

(Concluded from Page 1, Column 5)

Davis and W. B. McMillan, of the organization's committee on sales financing.

As a result of the attention given to this problem by C.R.M.A. members two years ago, it was recalled, the organization developed a uniform terms and financing plan—20% cash down payment and terms not to exceed 24 months—under which the bulk of commercial refrigerator products are sold today.

The resolution regarding instalment terms, unanimously approved by executives present, commended finance companies for their present stand, and pledged cooperation in their current campaign to eliminate instalment selling abuses.

J. I. Holcomb, of Holcomb & Hoke Mfg. Co., was elected president of the association for the 1937-38 term, and W. B. McMillan, of Hussmann-Ligonier Co., was named vice president. Treasurer is R. E. Davis, of McCray Refrigerator Co., and directors are A. L. Goetzmann, Puffer-Hubbard Mfg. Co., and C. V. Hill, Jr., of C. V. Hill & Co. E. E. McCray of McCray Refrigerator Co., was named honorary president of the association.

Committee members for the next year are:

Planning and Policies — R. E. Ottenheimer, Ottenheimer Bros.; Jerry Tyler, Tyler Fixture Corp.; R. P. Sherer, Sherer-Gillett Co.; E. N. Northey, Herrick Refrigerator Co.; and W. B. McMillan, Hussmann-Ligonier Co.

Traffic—H. L. Delp, McCray Refrigerator Co.; G. W. Orbesen, P. J. Orbesen & Co.; and E. S. Fowler, Fowler Equipment Co.

Market Development — R. P. Sherer, Sherer-Gillett Co.; H. C. Schmidt, Cincinnati Butchers Supply Corp.; R. E. Frederick, Standard Refrigerator Co.; G. W. Orbesen, and C. V. Hill, Jr.

New Materials—J. S. Hill, C. V. Hill & Co.; E. S. Fowler, and R. W. Bouldin, Holcomb & Hoke Mfg. Co.

Industrial Relations—A. L. Goetzmann, G. E. Friedrich, Ed. Friedrich Co.; H. C. Ahrens, The C. Schmidt Co.; and Raymond Starr, Koch Butchers' Supply Co.

Montgomery Ward Opens Dayton Appliance Store

DAYTON—Montgomery Ward & Co., Chicago, has leased a store at 46 N. Jefferson St. here for establishment of an electrical appliances department.

Wishart Heads Sales & Engineering for Fredericksen Co.

SAGINAW, Mich.—H. W. Wishart, veteran refrigeration engineer, has joined the Fredericksen Co., maker of "Sabeco" metal used in the manufacture of compressor parts, and will be in charge of sales and engineering for the company.

The announcement was made by Karl Agricola, treasurer of the Fredericksen Co.

Mr. Wishart will devote a part of his time to providing engineering information and advice to manufacturers on the use of "Sabeco" metals in compressor construction. Mr. Wishart started his career in refrigeration with the Wishart Ice Machine Co. of Springfield, Ill., and subsequently has been connected with Climax Engineering Co., Universal Cooler Corp., Stewart-Warner Corp., and Johnson Motor Co.

All-Norge Installations Up in Philadelphia

PHILADELPHIA—With four leading building contractors and a number of smaller ones featuring Norge equipment in model homes, the number of all-Norge installations in this city has greatly increased during 1937, according to Trilling & Montague, Norge distributor.

Among the Norge installations are the Alcott St. development of 60 homes, 15 homes in the John McClatchy development, Jefferson St. houses containing 48 installations, another McClatchy section on Glendale road, and a number of all-Norge homes in Chatham Village at Merion Hills, where 300 new residences are being built.

53 F-M Boxes Installed in Paterson, N. J. Apartment

PATERSON, N. J.—The Mayfair apartments, one of this city's largest and most modern apartment buildings, recently has been equipped with 53 Fairbanks-Morse Conservador electric refrigerators of 5-cu. ft. capacity. Installation and sale were made by Bruno-New York, Inc., Fairbanks-Morse distributor in this area.

Anchor Lite Co. Wins $150 In Radio Tube Contest

PITTSBURGH—Anchor Lite Appliance Co., distributor of home appliances in this area, won the first prize of $150 offered by RCA Mfg. Co. in a six-month sales contest on Radiotron radio tubes among distributors in the tri-state territory.

Combination Sale Instalment Terms Drastically Cut

(Concluded from Page 1, Column 3)

months to a maximum of 30 months. Terms on dishwashers, ironing machines, space heaters, and washing machines are being cut from a maximum of 36 months to a maximum of 24 months; while those on vacuum cleaners and household radio sets are being shortened from a maximum of 24 months to an 18-month maximum, according to Mr. Walker.

The most drastic shortening of terms applies to contracts involving combination purchases which previously could be extended to a maximum of 48 months, and which will now be limited to the maximum term applicable to any item in the combination purchase.

"An important change is being effected in regard to down payments, also," Mr. Walker stated. "Heretofore purchase contracts have been accepted without any down payment. A minimum down payment of $5 or 10% of the cash price, whichever is the larger, henceforth will be required.

"This action by the sales finance companies has been stimulated by the resolutions regarding instalment terms recently adopted by the National Retail Credit Association, the National Retail Dry Goods Association, and the National Retail Furniture Association.

"Its underiying motive, however, lies in the conviction of finance companies and appliance manufacturers that the liberal terms established to stimulate trade during the depression are no longer necessary to maintain a satisfactory sales volume," the association executive vice president stated.

1% Increase Made in G-E's 'Cost of Living' Plan

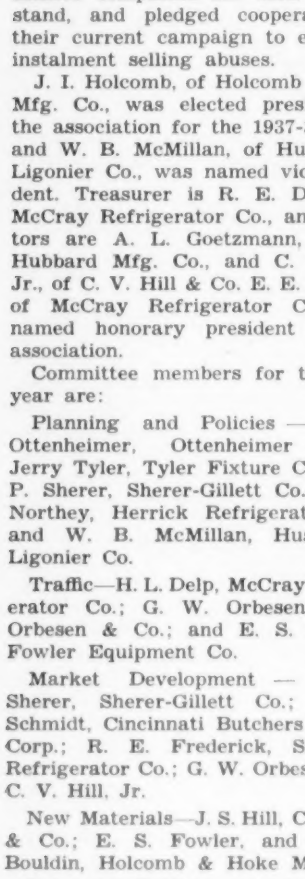
SCHENECTADY — General Electric Co. has announced an increase of 1% in its "cost of living" adjustment plan, raising it from 4 to 5%. Instituted in October, 1936, the plan provides for automatic increases in employe earnings, based on the progress of the U. S. Department of Labor "cost of living" index.

According to terms of the plan, if the cost of living goes up, 1% is added to employes' earnings for each point of rise in the index up to 90. If the cost of living goes down, adjustments will be made until the index reaches 80.

Peirce Phelps, Inc. Begins Washer and Ironer Drive

PHILADELPHIA—A sales campaign for Crosley Savamaid washers and ironers was started by Peirce Phelps, Inc., Crosley distributor in Philadelphia and Harrisburg, at a meeting Aug. 16 at the Benjamin Franklin hotel. A comprehensive direct-mail campaign to the dealers in the Philadelphia and Harrisburg territories will support the drive.

The meeting was presided over by J. Trevor Peirce, sales manager of the company. Attending were W. T. White, manager of the Crosley washer-ironer division and Frank Hogan, Jr., Crosley district manager.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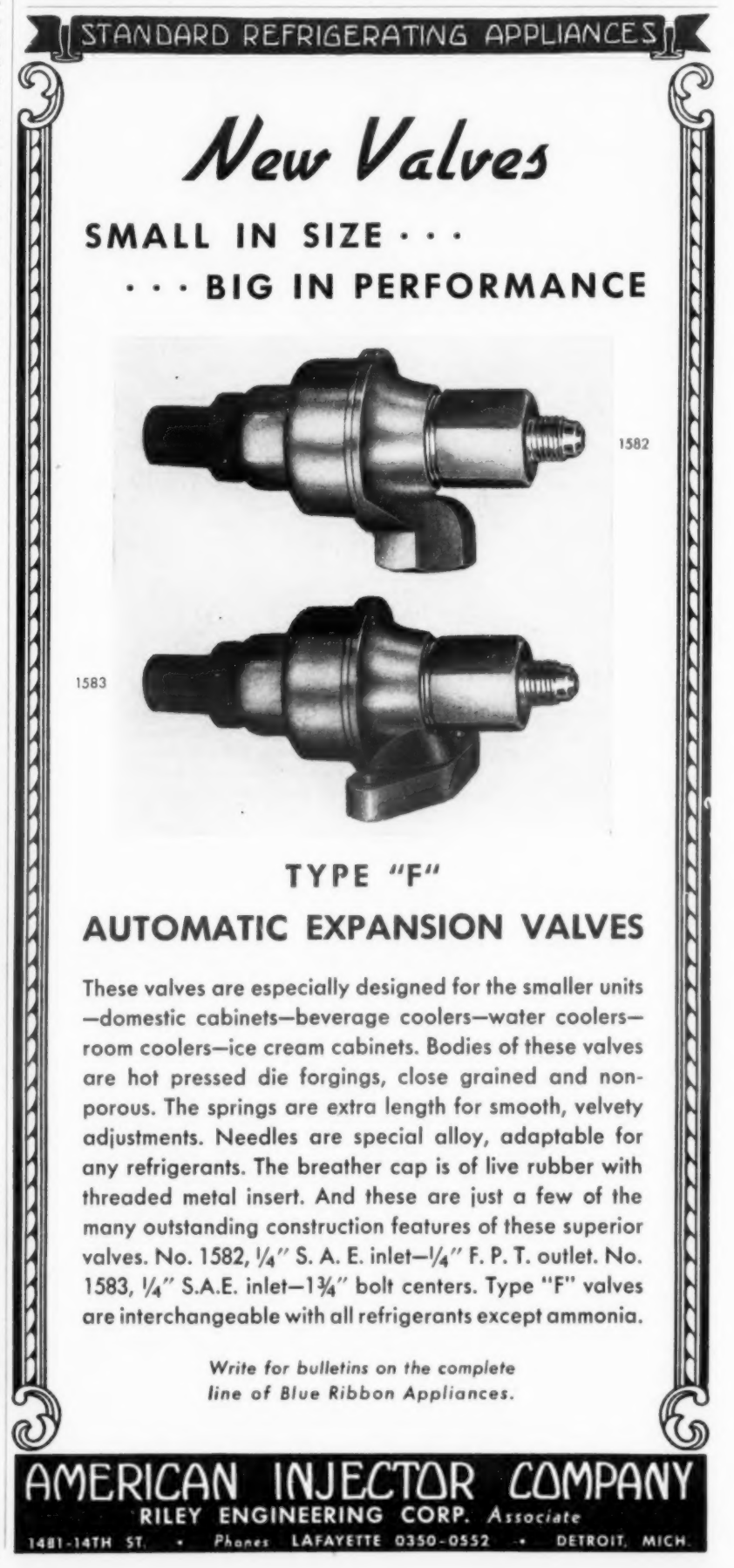
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AUTOMATIC EXPANSION VALVES
These valves are especially designed for the smaller units—domestic cabinets—beverage coolers—water coolers—room coolers—ice cream cabinets. Bodies of these valves are hot pressed die forgings, close grained and non-porous. The springs are extra length for smooth, velvety adjustments. Needles are special alloy, adaptable for any refrigerants. The breather cap is of live rubber with threaded metal insert. And these are just a few of the many outstanding construction features of these superior valves. No. 1582, ¼" S. A. E. inlet—¼" F. P. T. outlet. No. 1583, ¼" S.A.E. inlet—1¾" bolt centers. Type "F" valves are interchangeable with all refrigerants except ammonia.
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N.Y. Distributors and Dealers Condemn 'Reasonable' Trade-In Allowances

(Concluded from Page 1, Column 1)
additional discount in violation of the Feld-Crawford Act, and, therefore, not legal. This allowance must be based upon a reasonable basis in order to comply with the law.

"The intent of the Feld-Crawford Act was to protect the dealer as well as the customer from unfair trade practices. Therefore, it is my opinion that the courts will not enforce a contract which provides for a percentage basis of a trade-in allowance on the amount paid for the new set, but on the other hand will enforce a contract which provides for a reasonable allowance based upon the actual value of the old set."

General Electric Co. and Philco Radio & Television Co. are the only two New York radio distributors using the "reasonable allowance" clause in their price maintenance contracts with dealers. All other distributors have been using either the "fixed maximum percentage" provision, or are on a straight "fixed allowance" schedule.

Philco's attorneys, the law firm of White & Case, also had advised use of the "reasonable allowance" clause in a recent letter to the company, contending that contracts calling for "fixed percentage" allowances might not be enforceable under the fair trade law.

Sharp opposition to Senator Feld's opinion supporting "reasonable allowance" trade-in schedules was voiced by several radio distributors in the New York City area and by the Electrical Appliance Dealers' Association of Brooklyn, which last week unanimously passed a resolution condemning the "reasonable allowance" clause as "unfair and inacceptable in principle," and supporting the "fixed maximum" type of trade-in schedule.

The Brooklyn association's action followed an attack on Senator Feld's opinion regarding reasonable allowances by William H. Ingersoll of New York City, fair trade legislation pioneer, who said that the "true answer" to regulation of trade-ins would eventually come in the form of a "blue book" on radios and appliances, the same as that now used by automobile dealers, which would be made as much a part of the price control contract as the list price itself.

"If every time there's a trade the individual dealer can arrive at a 'reasonable' price, no two would arrive at the same price or value," Mr. Ingersoll said.

"If the list price is fixed, and the trade-in allowance bobs up and down, you have effectively scuttled the purpose of the law. There is but one workable solution—you must have a maximum fixed price."

In its resolution, the Brooklyn association said that:

". . . the refusal by manufacturers operating under the Fair Trade Act to establish reasonable maximum valuations on trade-in leads . . . opens the way to indirect rebating from the standard uniform prices on new merchandise which it was the purpose of the act to maintain, thereby defeating the policy of this state in respect to such merchandise."

One New York City radio distributor, who favors the fixing of maximum trade-in allowances, said that the "reasonable" allowance feature is similar to a rubber band, and that dealers may stretch it as far as they like.

Another distributor said that his attorneys had given him their opinion that the trade-in is part of the payment toward the purchase of new equipment, and therefore should not be considered a down-right discount.

In common with a third distributor, he held that a "test case" is the only thing that will throw an understanding light on the subject. All three were of the opinion that use of the "reasonable" trade-in allowance would not only prove injurious to the industry, but might lead to actual downfall of the fair trade act.

New Akron Dealership Opens

AKRON, Ohio—The Electric Appliance Shop has been opened here by J. T. "Dixie" Rice and Louis "Lou" Lotze. Frigidaire, General Electric and Westinghouse refrigerators are among the firm's line of appliances.

Gift Scheme Which May Damage Competitors Ruled Out in Calif.

(Concluded from Page 1, Column 5)
month. The person proves he was present in the store on that day either by registration in a book furnished for that purpose by the merchant or by having cash sales tickets, usually cash register receipts. The amount of merchandise given is determined ahead of time.

"Can such a scheme or plan be advertised? Is this conduct such as may be considered done for the purpose of injuring and destroying competition? Has it the effect of destroying competition? How can it be determined that one engaged in this plan may have an intent to injure and destroy competition?"

In the case presented, Attorney General Webb concluded that the merchant could not advertise his scheme if it injures his competitors or destroyed competition, and that the matter of injury is a question of fact and not of law.

CORRECTION

In a story published on page 1 of the Aug. 11 issue of AIR CONDITIONING AND REFRIGERATION NEWS it was stated that J. M. Gruitch had been named head of the service department of Airtemp, Inc. This was in error; V. P. Black remains as head of the Airtemp service department.

250 Dealers Attend 7 Hayer Sales Meetings

MINNEAPOLIS — To present the 1937 Electrolux sales program to its dealers, the F. C. Hayer Co., Electrolux distributor here recently conducted a series of seven meetings in its territory in Minnesota and Wisonsin.

More than 250 dealers attended the meetings, which were conducted by J. W. Slowe, district sales manager of Servel, Inc., C. A. Gruggel, service engineer with Servel, and H. B. Smithers, sales manager of the F. C. Hayer Co.

Omaha League to Sponsor Electrical Exposition

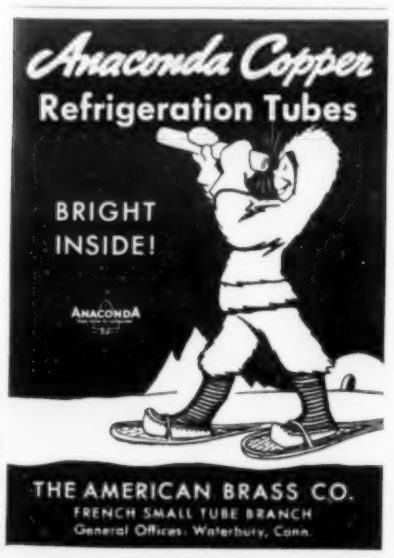
OMAHA — Omaha Electrical League, in cooperation with the Omaha World-Herald, is sponsoring a five-day electrical exposition scheduled to open Sept. 13 in the city auditorium.

Committee in charge of the exposition includes C. O. Heath, president of the league; Frank Wolf, the league's secretary; Charles Schreck, Shreck Electric Co.; Ned Reeves, Wright & Wilhelmy Co.; and T. W. Summers, of the World-Herald.

2 Apex Outlets in Midwest Named

CLEVELAND — Appointment of two new midwestern distributors for Apex appliances was announced recently by C. W. Smith, general sales manager of Apex Rotarex Corp.

New distributors are: E. S. Cowie Electric Co., Wichita, Kan., to serve central and western Kansas; and Fergason Bros., Waterloo, Iowa, to cover central Iowa.



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TEMPERATURE 100 degrees Fahrenheit—humidity at the saturation point! Even South African natives could work only a short time at the bottom of the East Rand Proprietory Mines, Ltd. But that was before the York Ice Machinery Corporation installed a modern air cooling system (at a vertical depth of 6,500 feet!) to lower the temperature.

Underground or under water, it pays to use the best equipment possible. That's why "Freon"* refrigerants are so often used in submarines for cooling and refrigeration.

The same considerations which resulted in the selection of "Freon" refrigerants for such unusual installations as these have dictated its use in thousands of air conditioning systems. "Freon" refrigerants are used in hotels and restaurants, in office buildings, theatres and stores, in factories, ships and homes. Over 99% of all mechanically cooled railroad trains use "Freon" refrigerants.

"Freon" refrigerants are non-poisonous, non-flammable, non-explosive. They are odorless when mixed with air up to 20% by volume. They do not harm foods, furs, flowers or clothes. They have been tested by the U. S. Bureau of Mines, and meet all the specifications set by the Underwriters' Laboratories of Chicago in their recent report, "Standard for Commercial Refrigerating Systems" (Subject No. 207). Write "Freon" refrigerants into your air conditioning specifications for safety of health, life and property.

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*"Freon" is Kinetic's registered trade mark for its fluorine refrigerants

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PROFITABLE SELLING

How Danforth Maintains Retail Stores on Friendly Terms with Dealers in Pittsburgh Area

PITTSBURGH—Belief that a refrigeration distributorship can retail its line in the same territory with its dealers and operate cooperatively and on a friendly basis with them is expressed by Robert G. Eckhardt, general sales manager for the Danforth Co., Allegheny county Westinghouse distributor here.

Despite the fact that most dealers would resent retail operations by their distributors in the same city, says Mr. Eckhardt, the Danforth Co.'s 60 enfranchised outlets have expressed approval of the plan over a period of several years. Most of them, he declares, consider the arrangement a standard-setter in which both divisions must hold up their respective ends.

Now in its seventh year as local distributor for Westinghouse household and commercial refrigeration and air conditioning, Danforth Co. stocks, makes all installations, and services equipment sold by its retail outlets, leaving only selling operations to local dealers.

SALES UP

Substantially increased sales figures for the first five months of this year under a wholesale-retail distributing plan are attributed by Mr. Eckhardt to the close spirit of cooperation manifested by the company's local dealers. The fact that Danforth Co. handles no other lines of appliances also contributes to better integrated selling, he believes.

In its retail operations, this firm has put the "thumbs down" sign on cold canvassing and at the present time is obtaining 80% of its prospect names from owners.

"Using the user," says Mr. Eckhardt, "is more than a mere catch phrase with us. We keep our 10 salesmen plenty busy contacting our customers, and through their help we do most of our selling.

"Rather than feeling that we are being 'snooty' or are 'horning in' on their business, our dealers tell us that they believe our participation in retailing the line helps to put over Westinghouse in a bigger way here than if we simply sat back and wholesaled the line to them," he continued.

"We keep a careful check on all prospects in the territory and aid our dealers to reach them as quickly as possible in their respective areas. In this way, each of us sticks to his own sector, nobody steals a sale, and our mutual reputation for service extends out to the public profitably to both."

ALLOWANCES FLEXIBLE

In handling trade-in allowances on used mechanical refrigerators, Danforth Co. leaves the amount up to the discretion of the individual dealer. Varying conditions in the territory make this flexible policy a wise one, the company management believes.

Twice each year, the distributorship mails form cards to its past customers offering a $5 cash award for each prospect name which is later sold. Salesmen are instructed to visit owners' homes once each month to inquire if the box is operating satisfactorily and to obtain additional names.

Nothing is more conducive to building a healthy prospect list, says Mr. Eckhardt, than the tendency of housewives to "show off" their new refrigerators to neighbors and friends—if the salesman keeps in close contact with recent customers.

Danforth salesmen are required to visit new owners within three days after the installation is made. Here, time and again, he declares, Salesman Smith will find Mrs. Jones proudly displaying her new purchase to bevies of friends, and right there is an opportunity for a worthwhile demonstration backed by first-hand user satisfaction.

"During the past few years, we have made several sales right in a user's kichen and have obtained many prospects which our salesmen were able to sell within a short time," says Mr. Eckhardt.

PROVING KITCHENS PUSHED

Besides actively pushing the Westinghouse "Hell's Kitchen" demonstration unit in its wholesale-retail setup this year, Danforth Co. has initiated a plan of encouraging its dealers to install their own proving kitchens in homes of their prospects.

Several of these have been installed and tested in metropolitan Pittsburgh. Not only do they serve as a convincing sales argument with purchasers, declares Mr. Eckhardt, but they have also aided in selling the dealer on his own line and have encouraged him to stress economy of operation with tangible proof to back it up.

DANFORTH SETUP

Danforth Co.'s wholesale-retail distributorship functions in a four-fold manner, says its sales manager:

(1) It operates a relatively small retailing function as a stabilizing influence on its dealers;

(2) Maintains demonstration departments in local furniture stores;

(3) wholesales to its dealers; and

(4) works in conjunction with Duquesne Lighting Co., Pittsburgh utility, and its subsidiaries in promoting the Westinghouse line.

Threat of the ice box trade-in problem to the industry, and especially a growing public demand for exorbitant ice box trade-in allowances, is viewed by Mr. Eckhardt as a thorn in the side of legitimate refrigeration business. To combat it, Danforth Co. has set a $10 limit on ice box allowances, with the present average being about $7.50.

CASH SHORTAGE

Major sales resistance in the Pittsburgh territory is considered by Mr. Eckhardt to be a combination of general lack or ready cash among buyers coupled with their fears that they will not be able to keep up their payments because of the strikes which paralyzed the local steel industry and factories.

"Most low-income group prospects feel they can obtain the necessary money to place a down payment on a refrigerator," says Mr. Eckhardt, "but few of them are willing to take the chance of having the box repossessed when strikes threaten to stop their incomes.

"Business is better here than in several years," he continued, "but a general fear of strikes and their consequences still persists among working men and their wives. When that is over, sales should increase materially."

BONUSES FOR SALESMEN

To encourage its salesmen, the company has recently instituted a system of monthly, quarterly, and annual bonuses on their refrigerator sales.

For each sale, salesmen are paid $1 additional on a rising scale, with an extra $1 being paid for each successive sale over the first each month. If the salesman makes his quota for three successive months, a quarterly bonus of $2 per box is paid for the entire period's total sales.

Salesmen who sell 60 or more refrigerators during this year will be paid an additional $2 per box on Christmas Eve, Dec. 24. The plan covers only straight retail business at standard list prices. Already, says Mr. Eckhardt, competition among Danforth Co. salesmen is keen for the extra bonuses.

Sales training in the distributorship is supervised by J. W. Dorris, sales promotion manager, who conducts three-days schools on alternate weeks for dealer salesmen. About 300 retail salesmen employed by Danforth Co.'s 60 dealers are handled in groups varying between 15 and 40 in this way.

HOME SERVICE STAFF

Three home service workers are employed by the distributorship to conduct cooking schools and demonstrations. Frequently women's clubs and individual owners call upon these women to prepare special desserts and salad courses for social affairs, thus offering prospect-getting opportunities. After each sale, they are sent to the customer's home to demonstrate the refrigerator.

Danforth Co. moved into its new home at 5820 Center Ave. here on May 1. Four departments—general sales, air conditioning, service, and clerical—are housed here together with the 85 employes working for the company.

The building occupies an area 90 feet by 153. Warehouse facilities for several thousand refrigerators is provided in the rear of the first floor, with showrooms and offices on the first and second floors in the front of the structure. It has been air-conditioned throughout.

Officials of the company are: I. Danforth, president; Robert G. Eckhardt, general sales manager; H. W. Reding, air-conditioning manager; T. E. Renton, Jr., engineering department manager; R. T. Terrey, wholesale supervisor; M. Chisholm, commercial sales manager; N. Williams, service manager.

Can a Distributor Retail His Line Successfully?

Can a distributor do a retail business in the same territory in which his dealers operate, and maintain a harmonious relationship with those dealers? Yes, says Robert G. Eckhardt, if the guaranteed territory system is maintained.

How the Danforth Co., refrigeration distributor in Pittsburgh, does just this is told in the story on this page. The story also includes some good tips on up-to-date merchandising ideas.

Salesmen Set Own Quotas in Kansas City Sales Drive

KANSAS CITY—To spur August electric refrigerator sales, the Electric Association of Kansas City cooperated with distributors and dealers in a campaign Aug. 1 to 31 in which salesmen set their own quotas and received bonuses on an "everything or nothing" basis.

While salesmen set their own quotas, minimum quota per man had to be four refrigerators. Dealer quotas were set by the dealer and his city distributor salesman.

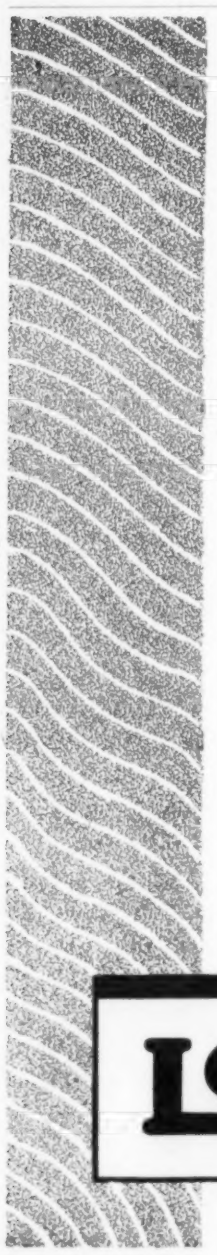
Salesmen received a bonus of 2% only on the quota he set for himself at the start of the drive. Thus, if a salesman set a quota of four refrigerators and sold more than that number, he received bonus only on four sales. If he set a quota of four and did not sell that many, he did not receive any bonus.

This system was designed to get salesmen to set their quotas reasonably high, and to work hard to attain them.

The 2% bonus to salesmen attaining their self-set quotas was paid by distributor, dealers, and the utility, the distributor contributing 1% and the dealer and utility company ½% each. Bonuses were figured on the dollar volume of sales, and were paid on sales of new 1937 model refrigerators only.

As a door-opener to be used in the drive, dealers furnished their sales men with a "nite-light" for use in the prospect's home. This premium has a similar purpose to the custard cups given away by Kansas City salesmen as door-openers in their spring sales drive.

Salesmen gave the prospect a card which entitled him to a nite-light upon calling at the dealer's place of business. This procedure, which gives the dealer a two-way opportunity to get his sales story across, proved effective in the spring campaign.



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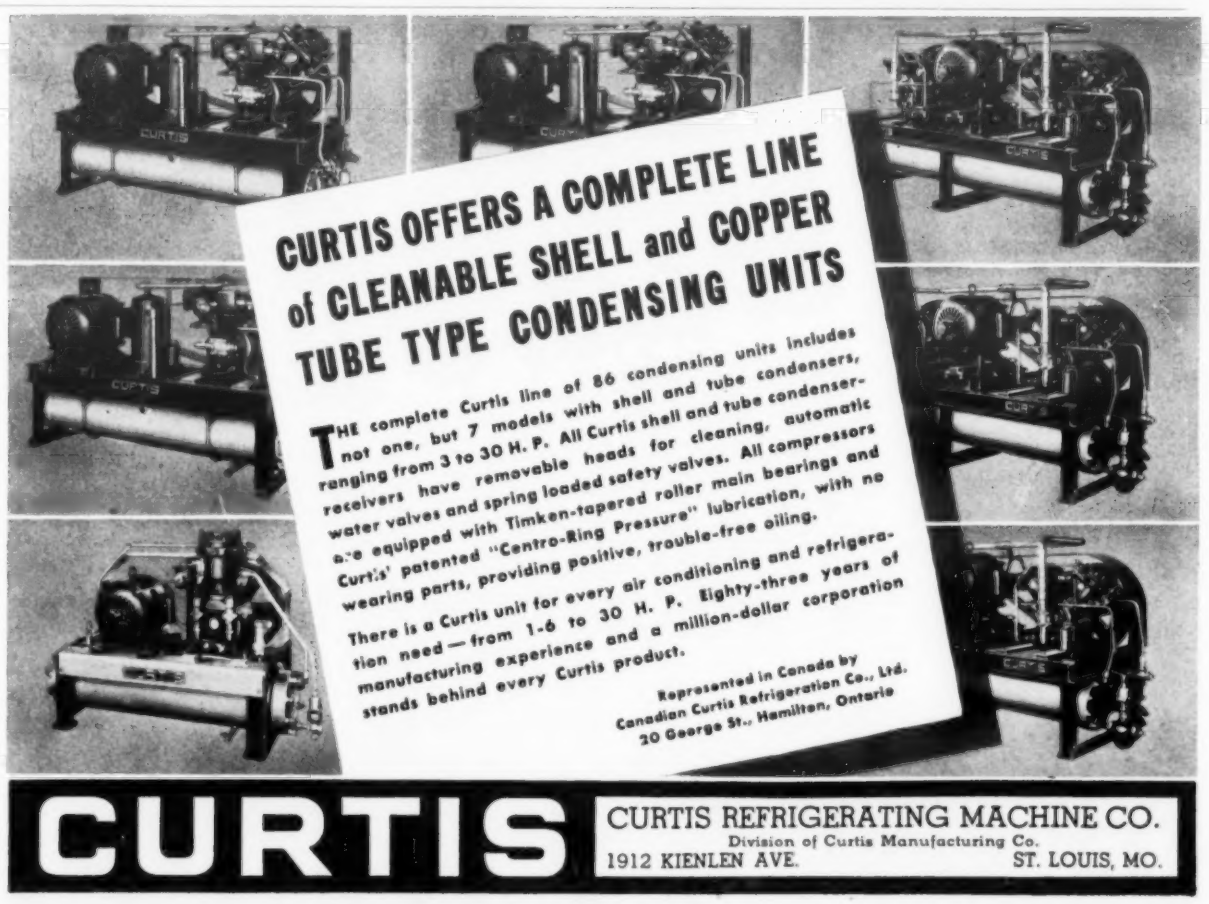
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THE complete Curtis line of 86 condensing units includes not one, but 7 models with shell and tube condensers, ranging from 3 to 30 H. P. All Curtis shell and tube condensers have removable heads for cleaning, automatic water valves and spring loaded safety valves. All compressors are equipped with Timken-tapered roller main bearings and Curtis' patented "Centro-Ring Pressure" lubrication, with no wearing parts, providing positive, trouble-free oiling.
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4 Separate Systems Cool Public Rooms In N. Y. Apartment

NEW YORK CITY—Four separate air-conditioning systems with a combined cooling capacity of 120 tons are being installed in the new Hampshire House apartment hotel at 150 Central Park South.

Installed by Carrier Corp. of Newark, the system will condition the main dining room, check room, promenade, bar and lounge on the first floor, and the banquet room and dining rooms, barber shop, beauty parlor and lounge on the second floor.

Equipment in the year-around system will be specially insulated against machinery noises and vibration, to assure quiet in adjoining guest rooms and apartments.

Two Carrier evaporative condensers will operate in conjunction with the installation to effect a saving on water consumption.

Started in pre-depression times, the Hampshire House was abandoned after approximately $3,000,000 had been spent; another $1,500,000 will be used to put the 36-story building in condition for October occupancy. Apartments for 218 families will be available.

Conditioning May Boost Taxes, Dallas Fears

DALLAS, Tex.—Prediction that buildings installing air conditioning would be in line for increased assessments, resulting in higher tax bills, was made here by Fred Cullum, city tax officer.

"I am reluctant to tax anything that is in the form of progress, but I am told that rents are being raised in some of the air-conditioned buildings and the city is entitled to raise assessments in some instances," Mr. Cullum said.

Extensive air-conditioning installations have been made in Dallas during the past year, and while many types of equipment make heavy demands upon city water and sewage facilities, the additional burden thus far has caused no embarrassment whatever to the city, according to Henry M. Robinson, water department senior engineer.

Joe Leopold, supervisor of public utilities for the Dallas Power & Light Co., said extensive cooling installations were creating a new summer problem for his company.

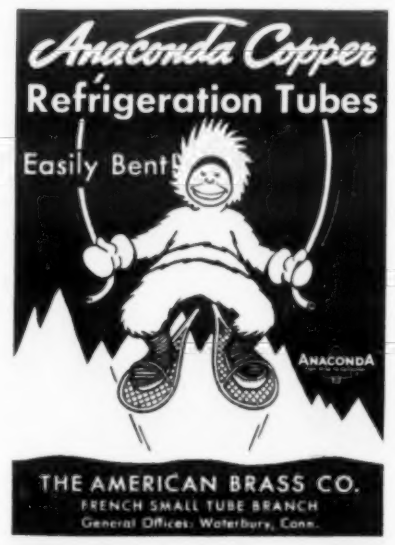
"The hot months were formerly light in comparison with the winter demands for electricity, but modern cooling systems are changing the whole picture," Leopold said. "The present tendency indicates that summer may eventually be the heavy season for producers of current."

Conditioning Builds Profits For Cleveland Shoe Store

CLEVELAND—Since Allen's shoe store here was equipped with a Westinghouse air-conditioning system, its profits have increased because patrons can shop in comfort, are not in a hurry to leave, and consequently buy better shoes, the management believes.

Sales of hosiery, purses, and similar accessories have also shown an increase since the air conditioning was installed, Allen's declare.

Reister and Thesmacher, Westinghouse air-conditioning distributor, engineered and installed the system.



Day of the Dealer in Air-Conditioning Sales Has Arrived, Montgomery Retailer Believes

MONTGOMERY, Ala.—The day for the dealer in air conditioning has definitely arrived, according to the experience of the Helburn Co., Frigidaire representative here. The company has handled more than $100,000 worth of installation work during the last six months.

Paul Renaud, head of the company's air-conditioning department, says that most of the big installations, handled by the factories, are already out of the way, leaving smaller installations and "package" jobs to be sold by dealers.

The Helburn Co. specializes in installations of less than 30 tons. Its regular line includes refrigeration and kitchen and dining room equipment for cafes, restaurants, hotels, and hospitals. Air conditioning was added to supplement the refrigeration line, and to meet the demands of clients served for many years, according to Mr. Renaud.

An air-conditioning engineer, who was the only person added when the air-conditioning equipment was taken on, handles the closing of sales and the installation. The company's crew of store equipment salesmen also dig up many air-conditioning prospects.

Explaining how the business works, Mr. Renaud told of a grocery store in Auburn, Ala. recently equipped with air conditioning. "This concern has been our customer for years, purchasing display cases, walk-in coolers, exhaust fans, and scales from us.

"When the owner became interested in air conditioning, it was only natural that he should turn to us for equipment," he added.

The company also recently installed a 27-ton air-conditioning system in a Selma, Ala. hospital—the first hospital in the state to be air conditioned.

Spaces cooled include the operating room, reception room, doctors' offices, and several of the patients' rooms.

New Governor of Mauritius Takes His Cooling Along

NEWARK—Another "first" in air conditioning be realized when Sir Bede Clifford, former governor of the Bahamas, arrives at his new post as governor of Mauritius Island, a British possesion 600 miles east of Madagascar in the Indian ocean, with the two Carrier portable air conditioners he purchased en route in New York. The two units will provide the first air conditioning on Mauritius.

Sir Clifford decided on his purchase after the successful use of air conditioning in the Governor's palace at Nassau.

Kelvinator Equipment Used in Buffalo Model Home

BUFFALO — Appliance Wholesalers, Inc., distributor, furnished Kelvinator air conditioning and a Kelvinator refrigerator for the "Five-Star" model home constructed here by the Buffalo Niagara Electric Co.

Ventilation Problem in Cave Night Club Solved

BIRMINGHAM, Ala.—How to ventilate Bangor Cave, an underground cavern used as a night club, was solved by John H. Bethune, proprietor of the Bethune Electric Co. here.

With an inside temperature of approximately 62° F., the cave was too damp and too cool for comfort. Ceiling and walls dripped water. Other contractors suggested that complete air conditioning, including heating air, was the only remedy for the situation.

Mr. Bethune installed an 84-inch ventilating fan which pulls air in through the entrance and exhausts it through a shaft sunk for that purpose. The fan circulates some 90 c.f.m. of air through the cave, raising the temperature within 10 to 15° of that outside.

In addition the air circulation dried up the ceiling and walls and prevented sweating due to the low temperature.

THEY GO TOGETHER

SMITH'S CAFETERIA, TOLEDO, OHIO, nationally known for good foods, installs McCRAY REFRIGERATORS operated by UNIVERSAL COOLER condensing units

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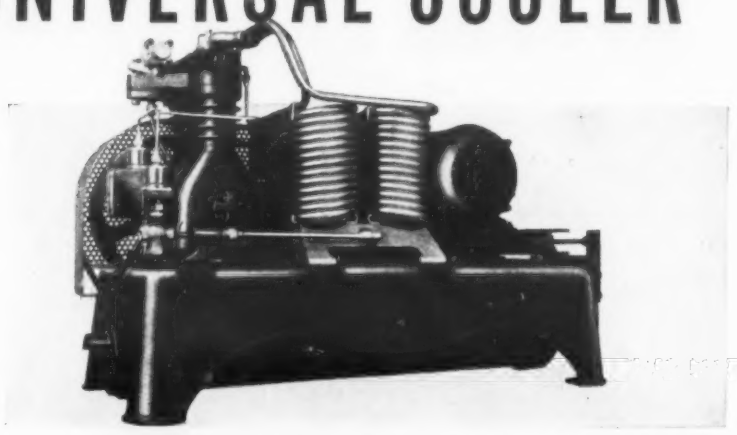
1 Pantry Refrigerator • 1 Salad Refrigerator
1 Dessert Refrigerator • 1 Delicatessen Refrigerator
1 Salad Pan (in window) • 1 Soda Fountain
5 Storage Coolers • 2 Freezing Rooms
1 Garbage Storage



The increasing frequency with which discriminating refrigeration buyers—both manufacturers and merchants—are selecting Universal Cooler condensing units for all types of applications is evidence of the thorough engineering, precision manufacturing and careful inspecting methods that have characterized our commercial refrigerating units for more than fifteen years. Write for complete information on Universal Cooler condensing units bearing your own brand name.

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FOREIGN TRADE

Argentine & Brazilian Markets Opening, Manufacturer's Agent Reports

By Phil B. Redeker

DETROIT—The boom in full force in Argentina and progressively better times in Brazil are bringing these two countries into the forefront as markets for American-made refrigerating equipment, declares E. L. Weldie, manufacturer's agent and distributor of refrigeration parts and supplies whose headquarters are in Sao Paulo, Brazil, with branch offices in Rio de Janeiro and Buenos Aires.

Mr. Weldie is currently on an extended visit to the United States, contacting manufacturers of refrigerating equipment.

Argentina's boom, says Mr. Weldie, has been occasioned by the sudden jump in demand for the commodities which she produces, such as grains, linseed oil, and hides.

Practically all household refrigerators are assembled in Argentina, the units being shipped in and the cabinets being made locally. This is necessitated by the high duty and the fact that the duty is on a per gross weight basis, thus making importation of complete refrigerators an economic impossibility.

Westinghouse, General Electric, and Frigidaire all have cabinet and assembly plants in Argentina, says Mr. Weldie. Kelvinator also has completed an arrangement to have cabinets made locally. Then there are a number of small cabinet manufacturing companies, many of them auto body concerns, that make a small volume of cabinets.

In Brazil the situation is not similar, since a low duty makes it possible to import complete electric refrigerators. Economic conditions in Brazil, while not having the stimulus of any big boom times, have been steadily improving the past few years with the result that the market for all products is improving, declared Mr. Weldie.

Until the past year the refrigerators were sold only to the top income class, since the minimum price was $250, but recently one firm has started to distribute direct to the public and has cut prices drastically, selling one model for as little as $125. This move has met with success, since it opened up the market in the lower income classes, and will probably be followed by other firms, Mr. Weldie believes.

American makes dominate the market, constituting probably more than 95% of the total volume sold, says Mr. Weldie. Some German models have been imported, but only a very few have been sold, as the South Americans seem to prefer the American trademark and the American cabinet styling.

Commercial refrigeration business has been good, particularly the sales to small independent service and installation firms, says Mr. Weldie. These firms are generally headed by a service man who once worked for one of the major manufacturers, but who has obtained some financial backing and has gone into business for himself.

One big market for commercial refrigeration is in the "ice cream machines" which are in great vogue in Brazil. These are in reality counter-freezer machines, although some are rather crude in design.

Brazilian children, it seems, are really ice-cream crazy, and since a frozen confection on a stick can be obtained for less than one cent in American money there is a great volume sold.

One of the costlier confections costs a little more than a cent, and is exactly the price of a Sao Paulo street car ticket, with the result that the ice cream retailer does a big part of his volume for street car tickets, which apparently constitute a suitable medium of exchange.

Much of the refrigeration equipment for these ice cream makers consists of old ammonia machines, but the modern small refrigerating machine is rapidly coming into the picture, says Mr. Weldie.

Showmanship Produces 45 Sales in Campaign In Colombia Town

MEDELLIN, Colombia, S. A.—Showmanship, backed by a carefully mapped out, hard-driving promotional campaign instigated by Robert Velez, U., manager of the Fomento Electrico Andino, Westinghouse distributorship here, to introduce the 1937 line of refrigerators, brought in 45 sales within six weeks.

For three weeks before the carload of 1937 models which it ordered arrived, the company ran an advertising drive in which it used newspapers, radio broadcasts, outdoor billboards, and handbills to announce the new line. Copy in these mediums stressed the U. S. government order of 16,697 Westinghouse refrigerators, and the "kitchen-proved" sales story.

When the carload of 50 refrigerators arrived, the crated models were loaded onto six trucks whose sides were decked with banners flaunting the two selling themes. Preceded by a band, the trucks were driven through the principal streets of the city.

At the same time 300 handbills were distributed, and radio and newspaper advertisements announced the arrival of the carload of merchandise.

Dramatic window displays, and the announcement of a key-and-lock contest, next figured in the drive.

This contest was put across by direct mail. Letters addressed to the housewife were sent to 3,000 picked prospects. Each letter informed the housewife that if she brought the enclosed key to the showroom, it might be one of three keys which would open the lock on a floor model, and win her one of the three cash prizes.

Further interest in the contest was drummed up through advertising and radio broadcasts.

Carrier System Simulates Cave Conditions at Fair

PARIS, France—A Carrier air-conditioning system, installed in the exhibition pavilion of the Roquefort cheese manufacturers at the Paris Exposition, maintains a temperature of 20° C., approaching the exact conditions in the original caves of Roquefort where the cheese is placed for aging.

Another Carrier system cools the all-glass Pavillon de Saint-Gobain at the exhibition. Due to the glass construction, the air-conditioning equipment has to reduce the heat caused by an extra heavy sun-gain load.

In all installations, the air-conditioning equipment is placed in glass enclosures in keeping with the exposition architectural motif, so that the public may see how weather is "manufactured."

At New Zealand's First Refrigeration Show

In front of Refrigeration Supplies, Ltd.'s booth at the recent first annual New Zealand Association of Refrigeration exhibition in Wellington are: R. W. McKenzie of Refrigeration Supplies Ltd., refrigeration jobber; W. A. Toogood of International Services Ltd., manufacturers' representative; Louis S. Hancock and J. Russell Hancock of J. Russell Hancock Ltd. and J. Russell Hancock (Australia) Pty. Ltd., manufacturers' representative in New Zealand and Australia.

* * *

New Zealand Group Holds First Show

WELLINGTON, New Zealand — The New Zealand Association of Refrigeration held its first annual three-day exhibition here July 1-3.

Although the exhibition did not arouse wide interest on the part of the general public because it was held in the middle of the New Zealand winter, among industry members it was considered highly successful, according to J. Russell Hancock, of J. Russell Hancock, Ltd., manufacturers representative here.

To importers a source of satisfaction at the exhibition was the interest displayed in air conditioning. There are but two air-conditioning plants in New Zealand at the present time.

While a demand for industrial installations is anticipated, the growth and acceptance of air conditioning for other than public installations is expected to be slower here than in territories with more tropical climates. High tariffs and freight charges make the importation of equipment almost prohibitive.

Among the firms who sponsored exhibits at the Association refrigeration exhibition were: H. W. Clarke, Ltd., Westinghouse distributor; A. & T. Burt Ltd., Stern distributor (British-manufactured machine); National Electrical & Engineering Co., Ltd.; W. A. Fisher, Ltd., Coldspot distributor; and Refrigeration Supplies, Ltd., refrigeration parts and supplies jobber.

Consul Reports Growing Demand in Venezuela

MARACAIBO, Venezuela—Demand for household electric refrigerators is showing a constant increase in this territory, reports U. S. Consul Archer Woodford.

All refrigerators sold here are of American origin, Mr. Woodford adds.

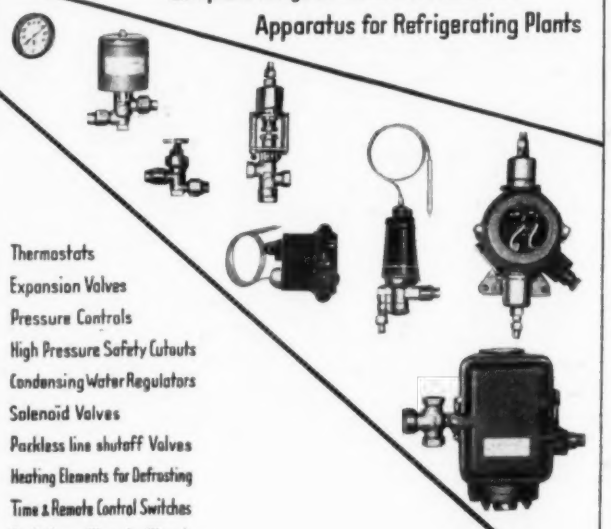
Venezuelan business conditions have been on the mend during the past few years, chiefly because of increased activities on the part of petroleum-producing companies.

The fact that business conditions now are good, and that there has recently been an appreciation of Venezuelan exchange from 3.93 bolivares to 3.19 bolivares to the dollar, should help refrigerator sales, the consul believes.

F. C. Lovelock Moves

SYDNEY, Australia—F. C. Lovelock, Ltd., manufacturers' representative, has moved from its old quarters to a new location at 16-20 Young St.

Complete Range of Control & Protective Apparatus for Refrigerating Plants



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IS IT SAFE FOR THE SERVICE MAN TO DO Anything Else?

Check These Outstanding Features of C-H Refrigeration Control

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- Famous C-H overload protection now available for replacement control
- C-H settings are *dependable*; stay the way you set them for years
- All wanted advantages: cold control; defrost position; adjustable temperature and pressure range; each model fits large or small openings; mounts horizontally or vertically; simple connections.

● Any service man who has been over the ground knows that more and more of the leading refrigerator manufacturers are *standardizing* on Cutler-Hammer Refrigerator Control. This fact is doubly important to the man who knows what thorough and exhaustive tests precede such a decision.

And every service man who is trying to establish himself soundly with his customers knows that what is best for the box *must* be best for him. That is why more and more service men standardize on the *same* control . . . Cutler-Hammer Control . . . for replacement service. *It's the only control that gives them the proven features of C-H Design.* Write for literature. CUTLER-HAMMER, Inc., *Pioneer Manufacturers of Electric Control Apparatus,* 1362 St. Paul Ave., Milwaukee, Wis.

CUTLER-HAMMER
REPLACEMENT CONTROL
C-H

United Kingdom, South Africa, Canada, Brazil, & France Are Chief Buyers of U. S. Refrigeration Equipment in 1936

U. S. exports of electric refrigeration equipment for 1936 as compiled by the Bureau of Foreign & Domestic Commerce of U. S. Dept. of Commerce

	Electric Household Refrigerators		Electric Commercial Refrigerators Up to 1 Ton		Parts for Electric Refrigerators
	Number	Value	Number	Value	Value
Europe					
Austria	419	$ 30,662	106	$ 7,039	$ 28,371
Azores and Madeira Islands	15	1,421	...	...	28
Belgium	2,435	179,839	880	71,638	102,765
Bulgaria	10	889	...	...	1,193
Czechoslovakia	721	34,622	30	4,175	80,771
Denmark	6	768	7	1,416	23,610
Estonia	1	146	...	...	...
Finland	253	20,657	137	13,817	35,106
France	8,664	581,001	3,847	265,730	481,727
Germany	28	2,737	72	5,852	2,810
Gibraltar	37	3,371	3	434	814
Greece	219	24,182	177	20,801	13,209
Hungary	4	621	...	...	441
Irish Free State	715	62,604	253	17,935	5,357
Italy	1,013	79,361	36	6,482	24,726
Latvia	10	726	...	...	38
Lithuania	17	1,625	...	...	...
Malta, Gozo, and Cyprus	15	1,409	3	172	583
Netherlands	2,419	177,246	908	79,244	97,985
Norway	1,575	117,987	202	22,811	47,774
Poland and Danzig	15	1,086	3	271	840
Portugal	216	18,639	27	3,658	5,370
Rumania	153	11,722	1	66	8,135
U.S.S.R. (Russia)	142	20,739	1	237	86,371
Spain	2,024	157,727	532	59,061	51,831
Sweden	2,304	167,952	482	49,421	133,060
Switzerland	969	74,799	15	1,274	54,359
Albania	9	782	...	...	...
United Kingdom	33,966	2,056,411	6,230	396,029	1,317,629
Yugoslavia	47	3,707	57	7,886	3,955
North America					
Canada	13,698	679,387	1,306	115,804	938,962
British Honduras	19	1,716	...	...	383
Costa Rica	356	22,963	17	3,954	1,848
Guatemala	236	18,902	9	957	1,300
Honduras	173	15,622	4	1,327	1,534
Nicaragua	57	6,667	2	493	413
Panama	1,093	123,035	137	26,240	25,266
Salvador	150	15,491	13	1,816	1,501
Mexico	4,935	414,648	360	51,666	74,131
Newfoundland and Labrador	105	10,148	8	2,045	1,390
Bermuda	523	46,515	53	9,698	8,958
Barbados	147	11,932	...	...	2,315
Jamaica	148	15,015	8	1,579	1,371
Trinidad and Tobago	357	34,206	27	3,159	3,245
Other British West Indies	190	18,187	27	3,680	4,569
Cuba	3,982	354,432	513	69,661	91,707
Dominican Republic	267	24,246	11	2,115	2,179
Netherland West Indies	934	88,259	82	9,945	10,811
French West Indies	148	12,508	8	663	775
Haiti, Republic of	128	11,115	3	424	4,527
South America					
Argentina	4,242	216,719	499	39,975	276,183
Bolivia	98	8,931	1	228	389
Brazil	11,520	893,885	1,591	165,615	131,254
Chile	628	49,165	47	4,014	9,111
Colombia	2,394	213,081	220	26,165	16,383
Ecuador	228	20,279	3	738	1,044
British Guiana	123	9,426	1	89	518
Surinam	49	4,444	1	28	463
French Guiana	...	...	...	...	111
Paraguay	128	11,463	...	...	439
Peru	886	76,258	74	11,761	13,403
Uruguay	979	74,302	223	19,981	25,132
Venezuela	2,253	185,688	137	18,324	11,325
Asia					
Aden	38	3,687	6	874	1,703
Saudi Arabia	49	4,713	2	1,135	1,635
British India	3,228	259,126	427	65,856	77,715
British Malaya	1,676	148,826	131	27,831	20,828
Ceylon	253	23,232	1	171	7,541
China	1,155	93,527	62	4,779	13,469
Netherland India	1,952	172,446	186	27,889	33,142
French Indo-China	752	67,527	24	6,712	18,937
Hong Kong	359	37,761	23	2,420	6,183
Iraq	155	16,487	7	767	633
Japan	231	25,148	168	22,251	53,693
Kwantung	48	4,519	...	...	170
Palestine	3,062	242,839	428	49,396	49,817
Iran	4	285	...	...	...
Philippine Islands	2,068	197,187	169	31,777	25,648
Siam	256	19,511	...	...	588
Syria	354	29,447	64	10,581	6,742
Turkey	1,707	156,511	319	42,805	14,676
Other Asia	20	6,000	17	2,972	254
Australia & South Seas					
Australia	2,626	164,907	59	3,762	120,675
British Oceania	32	3,508	2	452	1,671
French Oceania	25	2,253	3	315	378
New Zealand	2,156	173,388	641	70,264	49,237
Africa					
Ethiopia	3	277	...	...	...
Belgian Congo	141	14,963	2	132	4,272
British East Africa	278	24,769	8	1,109	5,269
Union of South Africa	22,244	1,840,819	1,572	168,370	306,652
Gold Coast	229	19,814	8	749	3,643
Nigeria	103	9,615	...	...	1,892
Other British West Africa	31	3,023	11	1,371	471
Egypt	630	59,149	89	11,978	13,767
Algeria	994	76,626	161	15,853	12,458
Tunisia	1,292	100,980	178	22,401	18,595
Madagascar	98	7,457	2	150	560
Other French Africa	468	39,357	3	424	4,341
Italian Africa	3	316	2	660	95
Liberia	15	1,299	...	...	16
Morocco	1,329	98,501	49	3,106	10,411
Mozambique	639	55,250	56	5,641	7,073
Other Portuguese Africa	...	...	...	...	25
Canary Islands	97	8,104	11	1,293	419
Other Spanish Africa	76	5,396	3	364	64
Total	**160,782**	**$11,767,666**	**24,297**	**$2,234,191**	**$5,169,543**
Shipments to Hawaii	5,265	521,672	225	35,093	69,219
Puerto Rico	3,767	368,756	299	44,865	36,906
Virgin Islands	46	4,599	7	1,493	1,463

Import Bans on Parts Loosened by Australia

SYDNEY, Australia—Permits for the importation of American-made sylphon bellows, sylphon seals, seal rings, rotary seals of 2 inches or more diameter, stellite, and gaskets for electric refrigerating machines are now being freely granted by the Australian government, according to assistant U. S. Trade Commissioner Wilson C. Flake.

However, the strict prohibition on imports of complete electric refrigerators or other parts remains intact, except that special permission is granted to import some parts for replacement purposes.

New Finnish Apartments Install Refrigeration

HELSINGFORS, Finland—Central refrigerating plants with individual cabinets in each apartment are being installed in most of the new apartment houses being constructed in this city, and in other leading cities in the country, according to U. S. Consul George Orr.

Mr. Orr also states that refrigeration installations are being made in many already established apartment buildings in an attempt to keep up with the modernization evident in the new blocks.

Refrigerating machinery used in these installations is bought from foreign manufacturers, and the cabinets are made locally. There is practically no demand for self-contained household refrigerators.

Deferred Payments Build Sales in South Africa

JOHANNESBURG, Union of South Africa—Comparatively recent introduction of deferred payment plans in the leading South African cities has greatly increased electric household appliance sales, according to assistant U. S. Trade Commissioner F. J. Cunningham. Johannesburg, Durban, and Capetown are the major centers of development.

Particularly marked has been the increase in the sales of refrigerators, all newly constructed apartment houses in the larger cities being equipped with them.

Annual imports of refrigerators into South Africa total approximately 14,000 units, of which 80% are American. At present efforts are being made to obtain representation from Canadian manufacturers in the South African refrigerator market.

Like electric ranges, electric refrigerators may be purchased on deferred payment plans sponsored by the electricity supply commissions of the principal towns in the Union, although the majority of the units are sold by independent dealers who have their own instalment plans.

An electric refrigerator may be purchased either through one of the commissions or direct from a dealer on a 24-months payment basis.

Refrigerator sales are greatest during the summer months, which in this part of the world happen to be November, December, and January.

One of the leading dealers in Capetown has been averaging 80 refrigerator sales per month, and during a particularly hot spell in December he sold 17 refrigerators to individual customers in two hours.

The most popular refrigerator in Johannesburg is that selling for from $150 to $175, and having a capacity of 4 cu. ft.

Canadian & English Markets Barely Scratched, Hadden Says

LONDON, Ont., Canada — The Canadian and English markets for refrigeration and air-conditioning equipment have barely been scratched, in the opinion of C. W. Hadden, general manager of Kelvinator of Canada, Ltd.

Canadian sales have reached but 15% saturation, Mr. Hadden points out, compared with 41% in the United States. Sales this year are well above last year's mark, and he expects the Dominion market to show marked development during the next few years.

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FOREIGN TRADE

Modern Methods Adopted by Turkish Distributors

By John Strohm

Bourla to Air Condition Its Own Building

ISTANBUL, Turkey — Frigidaire has installed the only two air-conditioning units in use in Turkey, according to Fred Bourla, refrigeration manager for Bourla Freres.

"But we are already at work on a campaign for next year to break into the market which we believe exists in banks, offices, and theaters," he reported. "To start it off our company intends to air condition our building, both as comfort cooling for employes and for advertising purposes."

There has been a feeling among refrigerator dealers—Mr. Bourla does not share it—that air conditioning was too expensive and the people were not ready to accept it. He believes there is a definite market, and the sweating writer agreed with him in August that there was at least a need.

Mr. Bourla believes the small air-cooled self-contained unit would be the best seller. Water is expensive, and then, he thinks water cooling equipment rather cumbersome for small installations.

Refrigeration business is more than satisfactory. His company passed its 1936 mark of 1,000 units late in July, and is aiming now for 1,300 or 1,500. The most popular unit is the 4-cu. ft. capacity box. Of every 1,000 refrigerators sold, 150 are commercial units; 100 are domestic in size but used for commercial purposes; 450 are 4-cu. ft. boxes; and the remainder are various other sizes.

Bourla Freres & Co. took over Frigidaire in 1933, after other dealers had sold but 50 units a year. It advertised extensively, sold 250 the first year, has had a steady increase of business since.

The real commercial business is now born, he says. Two years ago he made an intensive effort to sell butchers refrigeration. But they were slow to buy because of the cost. Last year, however, a couple bought, and now they are all falling in line from necessity. The household line will continue to be the big business for the next few years, he believes.

Each year his company is selling deeper and deeper into the lower classes of purchasing power. The company gives 18-month terms, offers complete service for refrigerators and radios. Their advertising is mainly in Turkish newspapers, but the firm also uses a French and German paper. His company has a contract with the local electric company to sell Frigidaire equipment.

The household appliance line has no ready market in Turkey for a few years, he contends. "The people are different here, and will take slowly to washers, electric irons, and ranges."

Bourla Freres & Cie was established 18 years ago by two brothers. They now have another store in Istanbul, a branch in Ankara and Smyrna, 25 dealers throughout Turkey, and an organization of 100 men. In addition to refrigeration equipment, they handle RCA radios —top seller in Turkey—and also a complete line of electrical equipment, light bulbs, motors, etc.

* * *

Who's Selling Refrigeration to the Turks

In this second and concluding instalment dealing with the refrigeration and air-conditioning business in Turkey, John Strohm relates some of the experiences and problems of the distributors he interviewed.

Mr. Strohm is an itinerant journalist now on a trip around the world. He has interviewed refrigeration distributing firms and surveyed market possibilities in a number of foreign ports of call for a series of articles which have been appearing in AIR CONDITIONING AND REFRIGERATION NEWS.

Libert Sells G-E Household, DKW Commercial Units

"I could have sold several hundred more General Electric household jobs —but I didn't have them." That was the chief complaint of Robert Libert, local distributor for G-E domestic and German DKW commercial refrigeration. It was his first year selling G-E and the estimate of his needs fell short of the ready market he found for the goods.

He formerly sold DKW domestic refrigerators, but switched to G-E because "German household refrigerators cannot compete with the American makes."

His explanation: "German sales are relatively small as compared to the States; and manufacturers cannot afford to change models so often. Consequently, German refrigerators are always a lap behind the top-notch American domestic units, and nobody wants to buy an old model."

But he goes to bat for the DKW commercial job. He thinks it is as good as American makes, and cheaper. Furthermore, he can get special cases to fit the local customers' needs, by telling the German manufacturer what he wants. His sales have increased an average of 25% for the past four years, and, he expects a constant increase.

He handles G-E ice cream cabinets and bottle coolers because they are not a DKW specialty. Forty per cent of his goods are sold in Istanbul, the rest in Turkey through his dealers. He offers complete service day and night because "when a fellow's bottle cooler isn't working, he is losing customers—and I might lose one too."

He heads the only firm in Turkey devoted exclusively to refrigeration. Most of his money is made in commercial refrigeration. He got his start in 1924 with Frigidaire in Europe, came to Istanbul four years ago.

Mr. Libert gives as reasons why the air-conditioning market is not ripe in Istanbul as yet: (1) There's always a cool breeze from the Bosporous. (2) Temperature seldom exceeds 90° F. (3) Rich people who could afford it move out of the city during summer. (4) Theaters close because the buying class is out of town. (5) Too expensive.

However, he believes factories are a good potential market. But he, too, is "thinking about it," and getting ready.

* * *

Kelvinator Going Strong

"We sold 49 Kelvinators in 1930; last year we sold 1,000; and this year we're aiming at 1,500," says Vortik Kement, manager of the firm Schoor & Guessarian, dealers in refrigeration, radios, and gramophones.

The company's main refrigeration market is in Istanbul although it distributes to all of Turkey through 22 branch stores and many small dealers. Air conditioning the firm is "thinking about," but hardly believes it will take hold for a couple of years yet.

Biggest money maker is "His Master's Voice" gramophones and records; of the latter they sell 600 a day.

"There are only about 10 cities in Turkey where they have electric power night and day, so radios do not offer serious competition," he said. But he gave another interesting reason for the gramophone's popularity.

The government forbids more than an hour of Turkish music to be broadcast daily, since it wants the influence of European culture. So old timers whose hearts tick the same and whose desires remain unchanged despite the government's modernization program buy gramophones and records to hear the old Turkish songs. A goodly portion of the sales also comes from a modern generation which has learned to dance, must have dance music.

Refrigeration equipment is the firm's second best seller—last is Marconi radio. (Al Smith would be at home in Turkey—radio is spelled radyo, pronounced the same.) Radio sales boomed for a time, but soon lagged behind gramophone.

Turkish Kelvinator Showroom Has Its Own Art Gallery

Customers of Schoor & Guessarian, Kelvinator dealer in Istanbul, get a double treat when they enter the company's display rooms. In addition to the attracti ve lineup of refrigeration equipment, the walls have beautiful murals of old-time dancing girls performing for their masters in the accepted Turkish fashion.

Fun for Turkish Kiddies

They have merry-go-rounds in Turkey, too—but it's not all fun for everybody. For instance, this one wouldn't run long if that fellow in the center stopped turning the crank.

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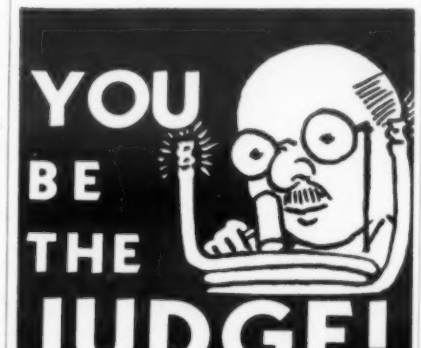

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COMMERCIAL NEWS

Selling Prospect What He Needs, Instead Of What He Asks for, Makes Friends For Chicago McCray Branch

CHICAGO — Selling refrigerator service—giving advice on prospects' individual refrigeration requirements—is the sales precept which McCray salesmen here followed in making 60 wall-type commercial refrigerator sales since Jan. 1, says Frank Murphy, local branch manager.

The salesmen do not always sell the customer what he wants, but rather the equipment which is most suitable to his needs, says Mr. Murphy, who has had 20 years' experience in selling McCray equipment. And very often, he adds, wall-type refrigerator storage space answers the need.

To illustrate how the selling methods work out, Mr. Murphy told of a prospect recently contacted in Joliet, Ill., who already had a McCray double-duty display case, needed additional storage capacity, and was considering the purchase of another double-duty case.

In checking the store's requirements, Manager Murphy noted that floor space was at a premium, that the prospect's chief need was to secure added storage space for meats, and that the storage base in the double-duty case already installed was so overcrowded that proper air circulation was prevented, and it was inconvenient to handle meats.

Installing a second double-duty case would not solve the problem, Mr. Murphy decided. So he pointed out to the prospect that a wall-type refrigerator would provide greater cubical content and would take up floor space in a more available location than would space required for another display case.

The wall-type installation, he also explained, would cost less money. Convinced, the prospect purchased.

The markets which have proven most fertile fields for sales of wall-type refrigerators, Mr. Murphy said, are bakeries, delicatessens, groceries, and taverns.

"We have also found a market for their sale in many food stores handling bottled and canned beer," he declared, mentioning a follow-up call on a bakery display case prospect who changed his mind and bought a wall-type refrigerator for storing beer.

"We also sold an 8 x 8 cooler for this purpose, as well as several wall-type refrigerators. We believe that this field for equipment for beer cooling is not as competitive as other lines, and that will produce a volume of business if properly worked," said Mr. Murphy.

McLaughlin Addresses Retail Meat Dealers On Refrigeration

CINCINNATI—C. D. McLaughlin of the commercial refrigeration applications department of Kelvinator division, Nash-Kelvinator Corp., spoke on "Meat Market Refrigeration" at the fifty-second annual convention of the National Association of Retail Meat Dealers, held in the Netherland-Plaza hotel here Aug. 8 to 12.

Exhibitors of refrigeration equipment at the convention included Allied Store Utilities Co., Brunner Refrigerator Co. (of Cincinnati), Cincinnati Butchers Supply Co., Frigidaire Corp., C. V. Hill & Co., Inc., Holcomb & Hoke Mfg. Co., McCray Refrigerator Co., Kelvinator division of Nash-Kelvinator Corp., and The C. Schmidt Co.

All meats and meat products displayed in individual booths at the convention were kept in refrigerated display cases furnished by the companies showing equipment at the meeting.

Kelvinator System Used in Ice Cream Delivery Truck

EAU CLAIRE, Wis.—A new 350-gallon ice cream body, recently built here by Herman Tietz & Sons for the Tri-State Ice Cream Co. here, uses a Kelvinator mechanical refrigerating system in maintaining its 0° F. temperatures. The new unit travels over a 150-mile radius.

G-E Sponsors 'Transcontinental Blimp Race' to Stimulate Commercial Sales

CLEVELAND—To stimulate summer sales of commercial refrigeration equipment, General Electric Co. is running a national distributor contest in the form of a "Transcontinental Blimp Race." The drive, which started July 19 and ends Sept. 18, is being conducted as a mythical San Francisco-to-New York City flight.

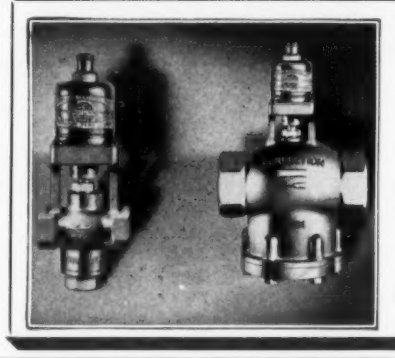
For the duration of the contest, each distributorship is known as a blimp, the distributor being the "commanding officer," the commercial manager of each distributorship the "chief pilot," and salesmen the "assistant pilots."

Each distributor has been given a quota in dollar sales of G-E commercial equipment to sell during the contest. All distributors in each of the 15 districts form a "squadron." Twenty-seven cash prizes are offered to squadron leaders, and four national prizes will be awarded to "blimps" covering the greatest distance.

To qualify for squadron prizes, distributor's sales records must represent coverage of three-fourths of the total distance within nine weeks. Those covering three-fourths of the flight in six weeks, and who chart the greatest distance during the entire period, will receive national prizes.

Weekly "race bulletins" are issued from the Nela Park "hangar," where W. E. Landmesser, head of General Electric's commercial sales department, is "flight commander." Each distributor has to submit weekly "weather reports" for his blimp to flying headquarters.

To provide weekly goals, "fueling stations" have been set up at Reno, Salt Lake City, Colorado Springs, Wichita, Kansas City, St. Louis, Louisville, Washington, and New York.



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Rupp & Angus Get New Posts with Lipman

CLEVELAND—G. Vance Rupp has been appointed manager of General Refrigeration Sales Co.'s branch office here, succeeding Frank M. Angus, who has been transferred to the managership of the company's Kansas City branch. In his new position, Mr. Angus supplants Paul Laughlin, who will retain his connection with the organization, doing some special sales work in the Kansas City territory.

Universal Cooler Equipment Cools New Canadian Brewery

LONDON, Ont., Canada—Installation of the refrigeration system in the new East London Brewery Warehouse was made by the Universal Cooler & Refrigeration Co., Brantford, under the direction of E. D. Schott, local agent.

Primarily to enable the installation of the refrigerating equipment, the new warehouse was built at 594 Dundas St. to replace the old building at 665 Dundas, which had no cooling facilities.

The refrigerating plant has been constructed so that supply trucks can be driven right inside for unloading and loading.

Sparta, Mich. Market Equipped By L. H. Udell Co.

SPARTA, Mich.—A walk-in cooler and a refrigerated display case were recently installed by L. H. Udell & Sons, Westinghouse distributor for western Michigan, in the W. S. Powers Market here.

The two-unit installation was designed by the Udell company and installed under the supervision of V. L. Udell.

Both units are equipped with Westinghouse condensing units and Fedders coils and valves.

Cartier Heads Kold-Hold New England Engineering

LANSING, Mich.—William E. Cartier has joined the Kold-Hold Mfg. Co. as refrigerating engineer in the New England territory with headquarters in Boston.

Mr. Cartier has been connected with the General Ice Cream Corp., Springfield, Mass., in charge of installation and service work on truck refrigeration equipment, and with the Icemaster Corp., Haverhill, Mass., where, in addition to truck refrigeration work, he was engaged in the manufacture and installation of refrigerating machines.

Below Zero Temperatures Held In Boulder Ice Cream Truck

BOULDER, Colo. — Temperatures between —10° F. and 3° F. are maintained by three Kold-Hold units hooked up to a 1-hp. Kelvinator compressor in a new 490-gallon ice cream body recently delivered to the Watts-Hardy Ice Cream Co. here by the Batavia Body Co., Batavia, Ill.

The body's bulk compartment holds 420 gallons, and an upper compartment in the rear holds an additional 70 gallons. The Kelvinator compressor is in the lower rear compartment.

The body is insulated with 6 inches of Dry-Zero in roof, sides, and ends, and 6 inches of cork in the floor.

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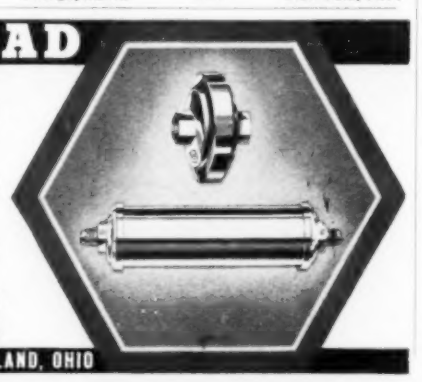

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AIR CONDITIONING AND REFRIGERATION NEWS

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Opportunity in 1938 Augured by 1937 Import Surplus

PESSIMISTS profess themselves to be alarmed over the import surpluses being created in our foreign trade for 1937. Despite the coming of boom times to Great Britain, South America, Japan, Czechoslovakia, Germany, Italy, Poland, Canada, and several other nations, it would appear that American exporters have not taken fullest advantage of the richer markets now available.

Our traditional export surplus was practically wiped out last year and, according to a survey recently made by the Guaranty Trust Co. of New York, our foreign trade has resulted in an import surplus in every month of 1937 thus far except May.

America Is Buying More Than It Sells

During the first six months our exports had an aggregate value of $1,534,000,000, while our imports were totaling $1,683,100,000. That leaves the United States $149,100,000 on the wrong side of the ledger.

Our export surplus for 1936 was $34,258,291, the smallest excess of exports over imports which this country has registered in 43 successive years.

Forced to Import Foodstuffs, Raw Materials

Two reasons may be assigned for this change in the complexion of our foreign trade: (1) Government-sponsored agricultural acreage reduction, plus Nature's own crop curtailment, forced large purchases of foodstuffs from abroad; and (2) the gradual return of our industries to normal capacity has necessitated markedly increased importations of raw materials.

At first glance it would seem that this country is "in a spot." If you buy more than you sell, you eventually go bankrupt. However, we have most of the gold in the world ($12,500,000,000 worth), plus long-term private investments in foreign countries totaling more than $15,000,000,000, according to Department of Commerce figures. Thus the United States is definitely a creditor nation, and a big one—with far more gold buried in the ground than is really good for it.

Continuation of import surpluses not only will enable foreign debtors to pay interest on our investments abroad, but should be the means of repatriating a portion of our huge gold excesses, and thus lessening the danger of monetary inflation in this country.

Foreign Nations Buy Where They Can Sell

There is even a more important reason why our present import surpluses are not bad news; and that is, foreign nations are most apt to place orders for things they want and need with countries which buy more from them than they sell to them.

Chief reason for today's muddled international exchange situation, with its attendant import quotas, tariff restrictions, and difficulties of getting money out of a land, is national poverty. Scant gold supplies and a dearth of foreign exchange prevent a nation from buying the products of another nation. The only way such an impoverished nation can buy from abroad is to sell, or trade, its own goods with a more fortunate nation.

Turkish Trade Policy Cited as Example

For example, John Strohm reported in the August 25 issue of AIR CONDITIONING AND REFRIGERATION NEWS that "Turkey follows a trade policy of buying only from those countries who buy more from Turkey than they sell to her.

"United States is exempt from quotas on this basis since her 1936 imports from Turkey totaled 13,419,496 Turkish lira, and her exports to Turkey were worth only 8,992,787 lira."

Hence American manufacturers of refrigeration and air-conditioning equipment can move right into Turkey and go to work. The same situation will hold true in a considerable number of nations in 1938. And now is the time to work and plan ahead for this business.

Export Trade Can Be Profitable 'Plus' Business

But, after all, is the export trade so important? Don't we all have enough to do right here at home, without getting mixed up with entanglements abroad? The answer to that is: export trade is usually a highly profitable business. It is "gravy," to use a colloquialism, or "plus" business.

Generally speaking, if a manufacturer no more than breaks even on his domestic sales, the surplus production which he ships abroad—if he has a strong export organization—will enable him to turn a neat profit on the year.

Certainly this is true of our national economy. In normal times, at least 10% of our exportable goods is sold to foreign markets. And 10% usually means the difference between prosperity and depression.

Refrigeration Exports To First 10 Markets

To show the importance of foreign trade to the electric refrigeration industry, one need only glance at the following tabulation of shipments to the first 10 nations (in order of importance) which bought such equipment from us in 1936. (A complete tabulation of refrigeration exports to 105 foreign countries is published on page 7 of this issue.)

Electric Household Refrigerators

	Number	Value
United Kingdom	33,966	$2,056,411
South Africa	22,244	1,840,819
Brazil	11,520	893,885
Canada	13,698	679,387
France	8,664	581,001
Mexico	4,935	414,648
Cuba	3,982	354,432
British India	3,228	259,126
Palestine	3,062	242,839
Philippine Is.	2,068	197,187

Commercial Refrigerating Machines (Up to 1 Ton Capacity)

	Number	Value
United Kingdom	6,230	$396,029
France	3,847	265,730
South Africa	1,572	168,370
Brazil	1,591	165,615
Canada	1,306	115,804
Netherlands	908	79,224
Belgium	880	71,638
New Zealand	641	70,264
Cuba	513	69,661
British India	427	65,856

Parts for Electric Refrigerators

	Value
United Kingdom	$1,317,629
Canada	938,962
France	481,727
South Africa	306,652
Argentina	276,183
Sweden	133,060
Brazil	131,254
Australia	120,675
Belgium	102,765
Netherlands	97,985

Total number of electric household refrigerators shipped abroad last year was 160,782, with a value of $11,767,666. Commercial units exported amounted to 24,297, with a value of $2,234,191. And $4,169,543 worth of refrigeration parts were sold in foreign lands during 1936.

1937 Import Surpluses Grease Wheels for Exports

As can easily be seen, these exports run into considerable sums of money. For the most part, this business is going to a relatively few manufacturers. Each of these important export factors expects to do a much larger business in 1938; while a number of other manufacturers which haven't been in the picture heretofore are making plans to get a share for themselves next year.

And the import surpluses of 1937 will not only grease the wheels for shipments to foreign nations of American refrigeration equipment—which hasn't a great deal of serious competition in world markets from manufacturers in other countries—but will provide those nations with the exchange needed to buy our products.

LETTERS

'International Edition' of Service Manual Proposed

Prof. E. Micheli
Via Agnello, 17
Milano

July 15, 1937

I have to acknowledge your honored favor dated April 29, 1937, and to thank you very much for the interesting items it has pleased you to communicate to me.

I have given my most careful attention, and I have called Mr. Faubini's attention, to the various subjects contained in your letter. As far as I am concerned, I shall be only too pleased to cooperate in any scheme you may adopt involving a knowledge of the Italian language. I only wish the idea of publishing the manual in four languages—one of the languages being the Italian—may materialize.

But what would be the languages? "English," "French," "German" and . . . "Italian" or "Spanish"? That is the point! Though it goes against my hopes and interest, I am, in honor bound, to say that undoubtedly the "Spanish" would be the more useful of the two, from your point of view. The possibilities offered by the great South American States are such that compared with them, the possibilities which Italy could offer are as *nought!*

Mr. Faubini has considered that paragraph of your letter in which you say: "We still have relatively little correspondence from Italy, and, personally, I am still rather hazy regarding the possibilities for American-made parts and equipment in your country. In other words, it is not clear to us whether the present restrictions upon trade are temporary or somewhat permanent."

Well, he has expressed the opinion, and has given me liberty to report it to you, that there is no hope of much improvement to the present situation for a long time to come. But apart from the economical and political reasons which created the present deadlock in the international trade, one must consider that insofar as "domestic" refrigeration is concerned, the possibilities in Italy are almost nil.

It is not only a question of Italy being a poor country and that the number of private families who can afford the cost of an electric refrigerator for the home can be counted—one might almost say—on your fingers, but the mode of living of 99% of Italian families is such that the question of refrigeration for food-preserving, even in the hottest weather—and it is pretty hot, as I write, I can assure you!—does not arise.

In Italy, there is not the system of going to market, or to the grocer's, or to the butcher's, and buy, say, a week's stock of food, which in countries is nicely kept in the refrigerated *larders!* Here the housewife, or the maid, goes out in morning and buys the necessary for the day's meals only—not an ounce more of anything above that—nay, sometimes, they go twice a day to shop: in the morning for the noon meal, and in the afternoon for the evening meal

Hence it is manifest that the idea of a refrigerator for the home is, in Italy, an unnecessary thing. People buy a small block of ice—in the very hot weather, just to cool the wine with—but that is all. Some well-to-do families especially if numerous—have gone in for one—(I have seen myself a "Frigidaire" or a "Kelvinator" here and there) but believe me, even when they have done so, they have done it more for *"swank"* than from actual necessity.

Commercial refrigeration is, of course, quite another matter. Hotels and restaurants and butchers and fishmongers and provision merchants, must of necessity provide themselves with modern refrigerators and they do; but here again, the question of price comes in—and so long as they will be able to find cheaper makes—even though not quite so good—than the American, I fear they will go in for the cheaper every time.

You see, "Frigidaire" have had a bright period of life, here in Milan, (I known personally Mr. Harlan, who for years was the Frigidaire Manager here in Milan—the brother of your "Kelvinator" Sales Manager in Detroit) but they have practically, now, closed down. "Kelvinator," themselves, did something here, but now I don't ever hear them mentioned any more. Some other makes, too, have made an appearance, but they all did little or nothing at all: and, believe me, for the very reasons which I have tried to place before you effectively and intelligently, I hope!

May I hope that you will see your way to send me a copy of the Manual in French and English, when ready? I should greatly appreciate it, if you would. E. MICHELI

Answer: Master Service Manual No. C-1, the first of the new series on Commercial Refrigeration is now ready for delivery. Two other manulas in this series (Nos. C-2 and C-3) will be ready soon.

It is this series of Manuals which is being translated into French. Most of the work of translating has been completed and a large portion of the material has already been set in type. However, we are not yet ready to make definite announcement regarding the French Edition.

We would like to have this series of Manuals translated into at least two other languages, preferably Spanish and German, so that we could issue an "International Edition" of the Master Service Manuals on Commercial Refrigeration. Each manual would be printed in *four* languages in the four parallel columns of each pair of facing pages.

We have an idea that such an edition of the Commercial Manuals would prove very helpful to the industry, not only in spreading information regarding the proper methods of installing and servicing refrigeration equipment, but also in standardizing the technical terms and expressions relating to refrigeration.

Suggestions regarding this project will be welcomed by the publishers of the NEWS. Correspondence is invited with translators who are thoroughly versed in refrigeration terminology and experienced in the translation of technical literature.

Midwest One of Larger Cabinet Plants

Midwest Stamping & Enameling Co.
Galesburg, Ill.

Aug. 23, 1937

Editor:

We have read with considerable interest the editorial entitled "Household Cabinet Production" in your Aug. 18 issue. The article contained some very interesting facts. However, we take objection to the following remark in the article: "Smaller plants like Sanitary of Fond du Lac, Wisconsin, and Illinois, of Morrison, Illinois, are also in the business.

The Illinois Refrigerator Co. which you refer to discontinued business in 1932. In 1934 the factory of the Illinois Refrigerator Co. was purchased by the Ice Cooling Appliance Corp., manufacturers of ice boxes and our own company. In January 1937, having outgrown our manufacturing facilities we moved to a larger factory here in Galesburg.

In view of the fact that your own publication has published a number of articles relative to our activities, both in Morrison and in Galesburg, we were suprised that the error was made both in the name of the company and location.

Furthermore, your statement "also in the business" is not, we believe, justified. This year we have had a capacity of 350 domestic cabinets daily and have been running continually over 300 a day actual production. We don't know any other firms who approach this production besides Seeger and Rex.

Beginning in October of this year we will have a daily capacity of 500 domestic cabinets daily in addition to greatly increased facilities for manufacturing commercial reach-in cabinets and display cases.

Publication of this letter or an item correcting the erroneous information contained in your article will be appreciated. J. C. BATTLES

Rotterdam Firm Wants Conditioning Franchise

N. V. Handelmaatschappij
Junker & Ruh
Rotterdam W., Holland

Sirs:

Will you kindly inform us about the price for subscription to the REFRIGERATION NEWS and let us have a specimen of this weekly for approval?

Some months ago you issued a number which contained a description with particulars and prices of the different makes of refrigerators on the American market. We feel special interest for this copy and if you could still send us one, we should be much obliged. After hearing we shall remit the amount due to you immediately by post.

We are also interested in air conditioning and should like to come into touch with one of the leading manufacturers in this line, for which we hope your periodical will procure us the desired information.

JUNKER & RUH

Valuable Addition

Institut International Du Froid
9, Avenue Carnot, Paris (XVII)

July 28, 1937

Publisher:

I have pleasure in informing you that the bound volumes Nos. 17, 18 and 19 of AIR CONDITIONING AND REFRIGERATION NEWS, have just come to hand.

I wish to express my great appreciation for your courtesy and feel that the collection is a very valuable addition to the Institute's library.

M. PIETTRE,
Director, Central Office.

THE AIR AGE

BY F. O. JORDAN

What Are Employers Doing About Training Men?

537 Chester St.
Brooklyn, N. Y.
Aug. 5, 1937

Air Conditioning Editor:

In that part of your column "The Air Age" in the issue of July 7, 1937, which reads "Opportunities for Really Trained Men," some very interesting points were brought out which I feel merit further discussion.

The main point of the article, it seems to me, is that employers are showing concern for the lack of "technically qualified men" and the inability of the supply to meet the demand for same.

In line with this, you also mention the fact that the "average air-conditioning course given today is not worth the powder to blow it to pieces."

I, personally, have every confidence in the course I am taking, enabling me "to figure the roof sunload and the sun effect on the west wall when the lag of each is six hours and occupancy load peaks at 6 p.m."

But the question that all the preceeding paragraphs have been an introduction to is, "What are the employers themselves willing to do to remedy the situation?"

Allow me, for the purpose of elaboration, to quote from an article in the New York Times of June 3, 1937, which deals with the report in the results of state tests given for machinists, sheet metal workers, tool and die makers, electric and acetylene welders, and sundry skilled men. This article is headlined:

900 JOBS UNFILLED BY STATE TESTS

Shutdown of Apprenticeships in the Slump Held Factor

Then telling about the alarming shortage of skilled men in these fields, the article reads further, "The virtual shutdown of apprenticeship training programs during the depression was among the contributory factors listed in the report."

I say now, speaking to the employers, "Are you willing to offer apprenticeships to conscientious air-conditioning students? Is it worth the $15 or so you will pay, and the added liability you incur, to know that you have working for you young men who will be more intelligent and capable in their practical work as a result of the excellent (only in some cases, I admit) theoretical background they are acquiring? In addition to this, also having in a short time skilled men, trained along the lines that may be peculiar to the type of work your company does."

Everyone can see that in the air-conditioning industry, the supply of really "technically qualified men" that can be turned out by the schools can not possibly catch up with the industry's phenomenal growth, at least for a few years to come. In such a case, I fail to see why the word "apprentice" should be anathema to service managers of certain outfits. I, for one, cannot think of a disadvantage great enough to outweigh the many advantages of offering apprenticeship training programs.

I feel that this "opening gun," as it were, should provoke discussion from your readers, especially air-conditioning service managers and other employers. ABE ELLIS

Answer: This question regarding the training of men for the air-conditioning industry is a most interesting one both to the prospective employer, to whom the present admitted shortage of technically qualified men threatens to be a barrier to the expansion of his business, and to the prospective employe, whose ambitions have directed his future-looking gauge toward the opportunities offered by the growing industry.

The practice of giving some form of an apprenticeship course now has some foothold among air-conditioning manufacturers, and appears to be growing.

Your "opening gun" should be of interest to many readers, who, we hope, will express their views as you have done.

Employers Decry Lack of Adequate Background

From the manufacturer's angle the difficulty is that although he lacks manpower, it is **trained** manpower he requires, not merely any kind of manpower.

As the production manager of a leading manufacturing firm recently told this writer:

"We have tried out many air-conditioning graduates of universities and trade schools, and find that most of them lack even a 'talking knowledge' of refrigeration and air conditioning. To be of any use to us, a man must have not only this talking knowledge, but must actually be able to think in terms of refrigeration and air conditioning. To get such men we find that we must train them ourselves, and this takes time and money."

When asked if it would save some of the manufacturer's time and money if the men whom he hires could be pre-trained in methods and fundamentals, he replied with an emphatic affirmative.

This same executive went on to explain that in his estimation pre-training would be of such value to the industry that he is in favor of some arrangement whereby air-conditioning manufacturers would pool their knowledge and information and make it available for certain approved training schools for the purpose of providing proper training for future employes.

The general term "Air-Conditioning Engineer" is a broad one which actually includes two distinct subbreeds.

One of these is the variety of engineer who plies his profession in the laboratory and design room. Although of unsurpassed value to the industry, this form of engineering life is practically unknown to the world at large, because it exists throughout its life within the confines of its native haunts, never coming out into the light of day. The result of the life and habits of this breed of engineer is the product which the manufacturer offers for sale.

The other variety of engineer, which is the one generally in mind when the term "Air-Conditioning Engineer" is applied, is the field or application engineer who designs the air-conditioning system in the field.

For the first mentioned class of air-conditioning engineer, commonly known by the personnel department as a "design" or "development" engineer, most manufacturers do not maintain a training course. The usual practice is merely to hire the brightest looking members of the graduating classes of universities having engineering on their curriculum, put them to work in very subordinate roles, and hope for the best. Eventually a few of these men become of value.

For training the field or application type of air-conditioning engineer, all air-conditioning manufacturers conduct some variety of training course.

The manufacturer of heavy equipment who maintains his own staff of field engineers generally gives a much longer course of training than the manufacturer of room conditioners who turns field engineering over to his distributors and dealers.

Since not only the performance but the sale of large commercial air-conditioning equipment depends very largely upon field engineering, makers of such equipment invariably maintain their own staff of highly specialized experts.

For training these experts, the course of study must be very thorough and requires considerable time.

In training the field engineer for the medium and smaller size of commercial project, most of the field engineering generally is done by the dealer's engineers, perhaps subject to check by the manufacturer's expert. The training of engineers for the dealer generally is accomplished by courses of a few weeks or months which are given by the manufacturer and supplemented by occasional short courses conducted at the dealer's place of business by a factory expert, or by an expert furnished by a large distributor who represents the manufacturer.

The men who attend these schools as students generally are hired by the dealer, although in some cases they are hired by the manufacturer for training, and afterward are transferred to the employ of the dealer.

Although there yet are many schools whose air conditioning courses spend their student's time in fruitless consideration of Charles Law and perfect gases, certain schools now offer courses prepared by experienced factory-trained air-conditioning engineers which can be of real assistance to all concerned and to the industry as a whole as sources of supply of pre-trained men who are well grounded in the principles and methods in use in air-conditioning practice of today.

Furthermore, there is a growing recognition of this fact by certain manufacturers.

There is no doubt that there is real opportunity in the air-conditioning industry, because it has doubled in volume each year for several years, and because it is a serious problem to find competent air-conditioning engineers in sufficient numbers to keep pace with the present rate of accelerated growth.

To take advantage of these opportunities, there are two ways open. One way is to convince some manufacturer or dealer that he can make a valuable asset of you without expenditure of an excessive amount of time and money in your training. The other way (perhaps the easier one) is to take a course of training which is of such a nature that hard-headed air-conditioning concerns will recognize its value in pre-training men for their use.

Wattless Conversation

713 Glenn St., S.W.
Atlanta, Ga.
Aug. 21, 1937.

Editor:

The article by F. O. Jordan, on page 9 of your Aug. 18 issue, concerning the Consulting Engineer, contains some very interesting comments.

If the "Big Butter and Egg Man" Sales Manager up Boston-way will take the trouble to drive about the country and make a few inquiries, he will be forced to admit that all of the mistakes of Moses were not made by the consulting engineer.

If he is really interested, this writer can furnish him with the correct locations of many air-conditioning plants that were engineered (?) by the manufacturers of the **ne plus ultra** in the air-conditioning field which have missed satisfactory performance by a whale of a big margin.

If he is interested, the writer can also give him the location of three air-conditioning plants that were engineered by the manufacturer's representative, the design of one of which was checked and approved by the manufacturer's high-powered Sales Manager, but strange to relate each of these installations had to be scrapped and other plants installed before the owner obtained comfort cooling. The one that was approved by the Sales Manager was corrected by a consulting engineer.

Some sales managers are long on wattless conversation and short on facts. C. T. BAKER,
Consulting Engineer.

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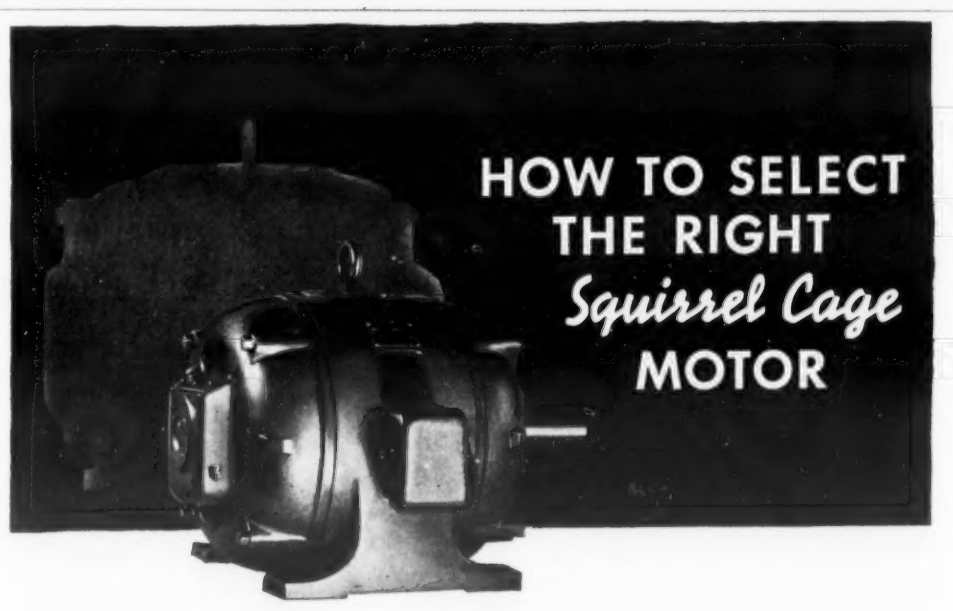

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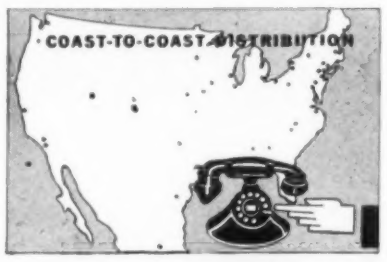

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SERVICE METHODS

Selecting Proper Combination Of Controls for a Milk Cooler

BY K. M. NEWCUM

24 Pearl St.
Brattleboro, Vt.

Editor:

I have a double-cylinder, ¼-hp. Frigidaire air-cooled condensing unit, which was originally used with a low-side float valve flooded evaporator. It is equipped with a regular Frigidaire low-pressure control and is charged with SO_2.

I want to use this condensing unit on a milk cooler. The milk cooler has a continuous copper tube direct expansion evaporator, submerged in a water bath. Before I make the installation there are a few questions I would like to ask. They are as follows:

1. Can I convert this condensing unit from SO_2 to methyl chloride and obtain satisfactory results?
2. If I use the present low-pressure control, will I have to use a different receiver, employing a high side float valve?
3. If I use an expansion valve will I have to use a thermostat to control the water temperature?

ARNOLD MERRITT.

Answer: The answer to your first question may best be stated by saying that it is not advisable to change the refrigerant from SO_2 to methyl chloride.

There are several reasons for making this recommendation. Principal reason is that the compressor was designed for SO_2 and should be used with that refrigerant. It will pump methyl chloride, or any other refrigerant for that matter, but if you wish to avoid service complications, use the refrigerant which the condensing unit was designed for.

A part of your second question will be answered along with the answer to the third question. The high side float will not be required in this application.

Question No. 3 may be briefly answered as follows:

If you use an **automatic** expansion valve as the refrigerant control, a thermostat will be required to control the temperature.

The automatic expansion valve maintains a **constant** pressure on the low side during operation, and for this reason, the low-pressure control will not operate to control the water temperature. (See pages 95 and 96 Manual No. 1 Master Service Manuals.)

The low-pressure control may successfully be used if a **thermostatic** expansion valve is employed to control the refrigerant flow into the evaporator.

There are two satisfactory methods of making an installation of this nature.

One is the use of an automatic expansion valve and a thermostatic temperature control. Install the automatic expansion valve at the inlet of the evaporator in the usual manner. Remove the low-pressure control from the condensing unit. Install a thermostat outside of the milk cooler cabinet, and place the thermostat bulb in the water bath, where it will always be covered over by the water.

Connect the suction line to the outlet of the evaporator and liquid line to the expansion valve inlet. Put the system into operation and adjust the expansion valve to utilize all of the evaporator, just so the suction line does not frost outside of the cabinet.

Adjust the thermostat to cut out at the lowest desired water temperature, and cut in at the highest desired water temperature.

As previously stated a thermostatic expansion valve may be used and the low-pressure control utilized.

Connect the thermostatic valve to the inlet of the evaporator **outside** the water bath. Clamp the thermo bulb on the tail end of the evaporator **inside** the water bath where it will always be submerged in the water.

The expansion valve should be adjusted to utilize all of the evaporator up to the thermo bulb, and to prevent the suction line from frosting outside the cabinet.

With the expansion valve properly adjusted the system should be operated until the lowest desired water temperature is reached and at this point the low-pressure control should be set to cut out.

With the condensing unit out of operation the water temperature and suction pressure will increase. When the maximum water temperature has been reached the low-pressure control should be set to cut in and start the compressor.

A Problem in Control Selection

Here is a typical problem that might confront any service engineer—the proper selection and combination of refrigerant control valves and temperature control devices for a submerged-type milk cooler.

K. M. Newcum, author of the Master Service Manuals, describes what combinations of controls should be used, and explains how they should be adjusted to give proper results.

Solenoid Starter Story Told in New Booklet By Allen-Bradley

MILWAUKEE—"The Story of the Solenoid Starter," a 24-page booklet fully illustrated with schematic drawings and photographs and printed throughout in two colors, has been published by Allen-Bradley Co., manufacturer of pressure controls, overload relays, safety switches, and starters.

Main theme of the booklet is that the solenoid-type starter has numerous advantages over the older, clapper-type. Principles on which each type works are described clearly and simply, partially by use of the question-and-answer method.

Assemblies of units are shown for use with different motors, and for performing special duties. Various models include switches mounted on the case and operated by hand, remote control facilities, or a combination of these. The combination is especially recommended for refrigeration application.

A line of accessories also is shown.

Cutler-Hammer Opens New Orleans Office

NEW ORLEANS—Cutler-Hammer, Inc., manufacturer of electric control equipment, is opening a new district office here Sept. 1 under the management of Joseph Gardberg.

Mr. Gardberg is a graduate of Georgia Tech, and has had several years' experience as a consulting engineer as well as in various other technical phases of the electrical industry.

The new district office will operate under the jurisdiction of A. C. Gibson of Cutler-Hammer's Atlanta office.

Delavan to Handle Motor Control Line in Iowa

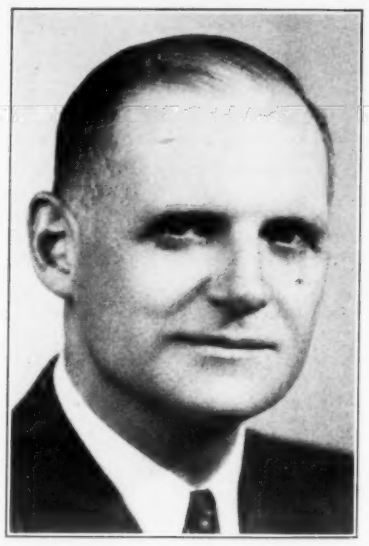
DES MOINES—Delavan Engineering Co. has been appointed Iowa representative for Allen-Bradley Co., Milwaukee manufacturer of motor control equipment.

The Delavan Co. is headed by Nelson B. Delavan, until recently vice president and director of sales of Penn Electric Switch Co.

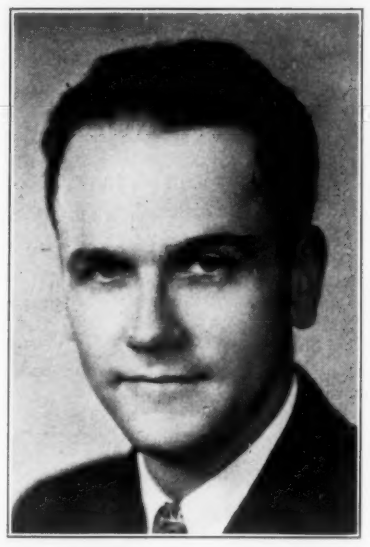
Wilson to Represent Allen-Bradley

HOUSTON, Tex. — Wilson Electric Equipment Co. has been named representative in the southern territory for Allen-Bradley Co., Milwaukee, manufacturer of motor control equipment. W. F. Wilson is president of the Houston firm.

New Penn Electric Switch Executives



P. L. TOLERTON
New manager of the Detroit office of the Penn Electric Switch Co.



PAUL O. PENN
Appointed assistant to Penn Executive Vice President Malcom E. Henning.

* * *

Paul Penn Takes Post At Penn's Main Office

GOSHEN, Ind.—Paul O. Penn, formerly manager of Penn Electric Switch Co.'s Detroit office, has been named assistant to Malcom E. Henning, Penn executive vice president, according to an announcement by Mr. Henning.

P. L. Tolerton is new manager for Penn's Detroit office, Mr. Henning also announced. Mr. Tolerton, a graduate engineer, was for several years in charge of the company's Chicago office. He also has had sales and engineering experience in the commercial refrigeration field.

Mr. Penn, who will be located at the company's Goshen offices, was in charge of the Detroit branch for six years. Prior to that time he was connected with Westinghouse Electric & Mfg. Co. in the heavy traction sales division.

Alabama Trade School Offers Air-Conditioning Course

GADSDEN, Ala. — The Alabama School of Trades, which opened its thirteenth annual session Aug. 16, is offering a course in air conditioning this year.

Emory Cunningham, who was graduated from the sheet metal division of the school in 1932, is teaching the course.

Persett Is Kelvinator Service Dealer

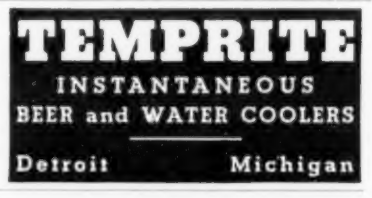
SYRACUSE, N. Y.—Persett Electric Service has been appointed authorized Kelvinator service dealer for this territory, reports H. A. Persett, manager. The company maintains a complete service for the installation, maintenance, and rebuilding of all makes of household, commercial, and air-conditioning equipment.

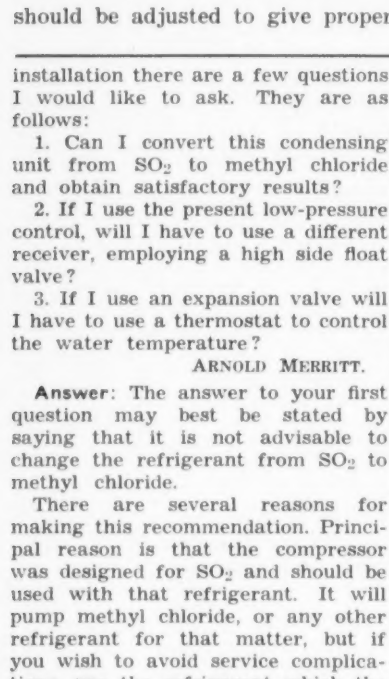
New Dealer Sells Gibson & Crosley in New Orleans

NEW ORLEANS—Auto-Lec Home Appliance Store has been opened here as a dealer for Gibson and Crosley refrigerators and other household electric appliances. W. J. Probst is store manager.

To Sell Kerosene Electrolux

HARTFORD, Conn. — The Supply Outlet Co. here has been appointed to handle distribution of kerosene-operated Electrolux refrigerators in Hartford and Tolland counties.





A contributing factor in the outstanding success of Kellogg direct drive Compressors is the unique arrangement of crankshaft seal assembly—made possible through the application of a Sylphon Seamless Metal Bellows.

This seal assembly is illustrated above. The Sylphon Bellows acts as an oil reservoir during off periods, as a means of maintaining a constant oil circulation during running periods while providing a gas tight seal at all times.

The wide use and highly successful service of Sylphon Bellows, in the products of the leaders in the Refrigeration Industry, are the result of 35 years of continuous research and experience in Bellows design and application.

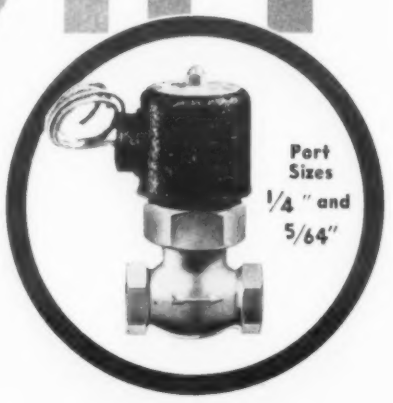
Why not come to the originators and pioneers of the Seamless Metal Bellows for the answer to your problem? Write for bulletin KO-121, sent on request.

FULTON SYLPHON Co.
KNOXVILLE, TENN., U.S.A.
Representatives in All Principal Cities in U. S. A. and in Montreal, Canada and London, England

TIGHT

NEW CONTROL OFFERS PERFECT SHUT-OFF OF LOW & FRACTIONAL TONNAGE INSTALLATIONS

The New GENERAL K-20A magnetic refrigerant valve provides positive control of low and fractional tonnage installations. The 5/64" port will hold tight on liquid line capacities as low as 150 BTU per hour.



$8.40 LIST PRICE

QUIET, DEPENDABLE OPERATION

Current-failure solenoid entirely quiet. Simple, packless valve construction eliminates all trouble. All materials corrosion-proof to refrigerants . . . coils water-proof . . . every valve rigidly tested. Write for catalog J-185.

GENERAL CONTROLS
1505 Broadway, Cleveland, Ohio
267 5th Ave., New York City, N. Y.
1370 Harrison St., San Francisco, Calif.
421 Dwight Building, Kansas City, Mo.

July Sales of Household Refrigerators By Nema Members to Distributors & Dealers Total 192,052 Units

The following 15 member companies of the Refrigeration Division of the National Electrical Manufacturers Association (Nema) reported household refrigerator sales for July, 1937: Apex Electrical Mfg. Co., Crosley Radio Corp., Fairbanks, Morse & Co., Frigidaire Corp., General Electric Co., Gibson Electric Refrigeration Co., Kelvinator Corp., Leonard Refrigerator Co., Norge Corp., Servel, Inc. (export only), Stewart-Warner Corp., Sunbeam Electric Mfg. Co., Uniflow Mfg. Co., Universal Cooler Corp., and Westinghouse Electric & Mfg. Co. Member companies not reporting included: Jomoco, Inc., Merchant & Evans Co., and Sparks-Withington Co.

The sales of the reporting companies do, however, include units manufactured for the following concerns: Major Appliance Corp., Montgomery Ward & Co., Potter Refrigerator Corp., and Sears, Roebuck & Co.

	SALES FOR JULY, 1937					
	Domestic		Canadian		Other Foreign	
Lacquer (Exterior) Cabinets Complete	Quantity	Value	Quantity	Value	Quantity	Value
1. Chest	508	$ 24,785	5	$ 243	7	$ 334
2. Less than 3 cu. ft.	....	.....	....	.....	....	.....
3. 3 to 3.99 cu. ft.	4,060	246,909	38	2,321	1,295	80,083
4. 4 to 4.99 cu. ft.	31,377	2,106,016	972	65,234	3,393	237,234
5. 5 to 5.99 cu. ft.	44,537	3,569,070	731	59,541	1,594	135,730
6. 6 to 6.99 cu. ft.	62,978	5,241,016	331	30,141	1,020	97,833
7. 7 to 7.99 cu. ft.	8,718	917,987	41	4,246	509	53,779
8. 8 to 9.99 cu. ft.	3,587	419,527	2	235	211	25,177
9. 10 to 12.99 cu. ft.	11	1,393	....	.....	....	.....
10. 13 cu. ft. and up	8	1,696	....	.....	....	.....
11. Total Lacquer	**155,784**	**12,528,399**	**2,120**	**161,961**	**8,029**	**630,170**
Porcelain (Exterior) Cabinets Complete						
12. Up to 4.99 cu. ft.	221	17,186	6	476	104	8,305
13. 5 to 5.99 cu. ft.	3,674	332,867	51	4,722	277	25,691
14. 6 to 6.99 cu. ft.	8,777	918,227	10	1,034	125	13,016
15. 7 to 7.99 cu. ft.	2,456	276,335	12	1,345	82	9,285
16. 8 to 9.99 cu. ft.	2,344	297,900	15	1,928	103	13,863
17. 10 to 12.99 cu. ft.	276	53,455	....	.....	47	8,565
18. 13 cu. ft. and up	779	158,470	9	1,641	90	20,500
19. Total Porcelain	**18,527**	**2,054,440**	**103**	**11,146**	**828**	**99,225**
20. Total—Lines 11 and 19	**174,311**	**14,582,839**	**2,223**	**173,107**	**8,857**	**729,395**
21. Separate Systems ¼ Hp. or Less	2,426	138,858	254	8,446	1,154	51,236
22. Separate Household Evaporators	2,677	21,752	2	31	148	2,978
23. Total—Lines 20, 21, 22	**179,414**	.....	**2,479**	.....	**10,159**	.....
24. Condensing Units ¼ Hp. or Less	1,177	53,934	25	1,632	179	12,230
25. Cabinets—No Systems	953	25,944	....	.....	11	80
26. Total Household	....	**$14,823,327**	....	**$183,216**	....	**$796,645**

New York's 22,246 Paces States in Sales for July

States and Territories	Quantity Household Low Sides
Alabama	1,819
Arizona	452
Arkansas	551
California	12,786
Colorado	1,390
Connecticut	2,521
Delaware	377
District of Columbia	1,740
Florida	3,197
Georgia	2,772
Idaho	1,018
Illinois	12,195
Indiana	5,136
Iowa	2,159
Kansas	1,584
Kentucky	1,913
Louisiana	2,149
Maine	697
Maryland	2,658
Massachusetts	6,769
Michigan	11,376
Minnesota	2,615
Mississippi	1,073
Missouri	4,457
Montana	1,062
Nebraska	1,177
Nevada	69
New Hampshire	578
New Jersey	7,761
New Mexico	411
New York	22,246
North Carolina	2,595
North Dakota	227
Ohio	11,954
Oklahoma	1,667
Oregon	1,714
Pennsylvania	17,978
Rhode Island	936
South Carolina	1,473
South Dakota	370
Tennessee	1,912
Texas	7,429
Utah	1,371
Vermont	429
Virginia	2,635
Washington	3,798
West Virginia	1,583
Wisconsin	4,312
Wyoming	323
Total United States	**179,414**
Canada	2,479
Other Foreign (Including U. S. Possessions)	10,159
Total For World	**192,052**

Note: This summary includes adjustment figures reported by several companies which do not represent their actual July sales but are corrections to be applied to their first six months' totals to give their correct total apportionment among the various states for seven months.

E. C. Tanner Named to University Staff

SPRINGFIELD, Mass.—E. C. Tanner, refrigeration development and design engineer at Westinghouse Electric & Mfg. Co.'s East Springfield works since 1931, has been appointed to the faculty of the school of business, engineering, and business curriculum of Northeastern university as instructor in engineering drawing and machine design.

King Heads New County Electrical Club

ITHACA, Mich. — Earl King, Ithaca, has been named chairman of the newly organized Gratiot county Electrical club, which will meet once a month at different points in the county. Dexter Duryee, Alma, secretary, and Cecil Knapp, Alma, treasurer, are the other officers.

Best Fall Season Since 1929 Predicted from Retail Store Survey

NEW YORK CITY—That department and specialty stores during the coming autumn months will find themselves in the midst of their busiest fall season since 1929 is the prediction made by National Retail Dry Goods Association on the basis of its nation-wide survey of the current merchandising outlook.

Improvement of general business conditions, definite gains in farm income in most areas, and increased building activity were cited by merchants as primary factors leading to the anticipated increase in fall business. Only the threat of continued labor unrest, political uncertainty, and restrictive legislation seem to exercise a braking effect on the general atmosphere of enthusiasm.

Average estimated business increase was 10%, though many merchants were far more optimistic, according to Channing E. Sweitzer, managing director of the association. Such an increase, Mr. Sweitzer pointed out, would boost department store volume to a point at least equal to that of the fall of 1930.

Estimates of anticipated sales increases in the department store field were found to be of almost even strength throughout the country, the estimate varying less than 1½% from coast to coast.

In all anticipated sales advances reported by various merchants, home furnishings took the lead. Seventy-one per cent of all stores covered by the survey named one of their home furnishings divisions as the department most likely to lead the sales increase. Thirty-four per cent of all departments in which merchants expected substantial sales increases were in the home furnishings line.

Although general price advances in much merchandise were conceded as inevitable by most of the stores polled, a majority of them did not anticipate any customer resistance to these increases. Many merchants expressed the sentiment that the public is well aware of the fact that price increases follow naturally in the wake of increased wage scales and general business improvement.

A large percentage of stores, however, reported that they are taking steps to soften these increases and make them as gradual as possible. Twenty-one per cent of the stores reporting such intentions plan to do it by holding down store expenses and increasing the price a little at a time; 15% intend to throw the emphasis of their promotions on quality, style, and merits of the merchandise, rather than on price; 9% plan to maintain well-balanced stocks with price and quality appeal for any class customer.

The "REASON WHY"—for Multi-Louvred Drip Pans on the Peerless Flash Cooler—

Everyone agreed that a coil would be better minus baffles which obstruct natural convection air currents. But Peerless engineers said, "If we have to have baffles let's make them do more than just catch condensate—and let's make them attractive." So they did.

The result was the Peerless Multi-Louvred, Non-Insulated Drip Pan. This Drip Pan not only allows free passage to cooled air falling from the coil but also directs this air into its proper channels. The pan is non-insulated but doesn't sweat. It is constructed of polished aluminum which makes the Flash Cooler the best looking unit of its kind that we've ever seen.

At the right Hank Bretag, engineer for Peerless' Los Angeles factory, looks on while Jerry Sumrall points out the fully open space between the directional air flow louvres.

PEERLESS of AMERICA, Inc.

Established in 1912 as the Peerless Ice Machine Company

Main Factory—General Offices

New York Factory, 43-20 34th Street, Long Island City — 515 W. 35th Street, Chicago — Pacific Coast Factory, 3000 S. Main Street, Los Angeles

PEERLESS JOBBERS IN ALL PRINCIPAL CITIES

BUY PEERLESS FOR PERFORMANCE

There's big money in the Koch line for properly qualified distributors. If your territory is not already covered, send in your application. Attractive financing plan. Exceptional cooperation from factory.

HE MADE $20,000.00 IN 2 YEARS SELLING KOCH PRODUCTS

THE NEW ECON-O-CASE IS A MONEY-MAKER For Koch Distributors

The Koch line is complete, including both porcelain and Dulux finished display cases, refrigerators, and walk-in coolers. Koch manufactures all types of refrigerated fixtures for markets, restaurants, bakers, florists, hospitals and other institutions.

KOCH REFRIGERATORS NORTH KANSAS CITY, MO. Export Dept.: 304 E. 45th, N. Y. City

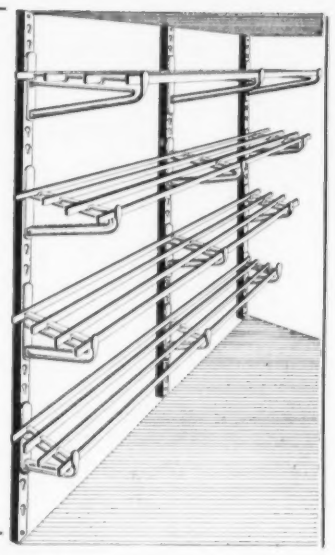
KASON

MODERN, SANITARY, *Adjustable* SHELVING FOR COOLERS, Etc.

The lattice shelving of this installation permits the free circulation of cold air around each article and assures its perfect preservation. Very easily installed and easily adjusted to meet changing requirements of the user. Will not collect dust or grime.

This and numerous other items of Supplementary Hardware for the refrigerator are presented in Section "D" of Catalog No. 38. Write for copy.

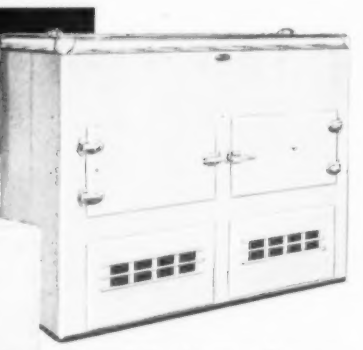
KASON HARDWARE CORP'N.
127-137 Wallabout St.,
BROOKLYN, N. Y.



A COMPLETE LINE *of the World's Finest* **COOLING EQUIPMENT**

PELCO Beverage *and* Beverage-Food **COOLERS**

PELCO cools faster—makes its own floating ice automatically—as needed. Beverages are cooled from room temperature to desired degree in about 30 minutes. Complete range of sizes in both combination and beverage cooler models provides an ideal PELCO for every need. Taverns, restaurants, hotels, lunch rooms—are prospects for PELCO. A few choice territories are still available. Get the facts! Write Desk A97.

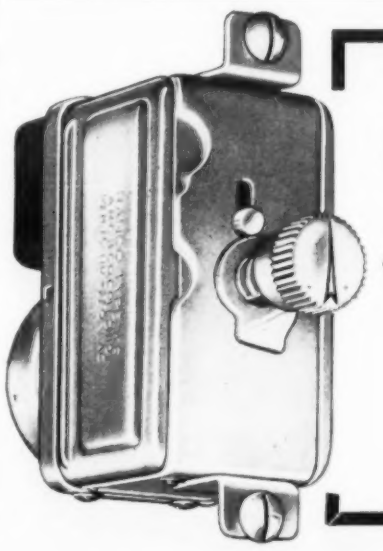


(Above) Combination Beverage-Food Cooler PELCO Model 200. (Left) PELCO Model 180 Beverage Cooler. Holds 180 standard 12-oz. bottles.

in Canada

UNIVERSAL COOLER CO. of CANADA Ltd., Brantford, Ontario

Mfg. by Refrigeration Division
PORTABLE ELEVATOR MFG. CO.
BLOOMINGTON, ILLINOIS, U.S.A.



Ranco EXACT REPLACEMENTS

BEFORE starting work on the thermostat replacement for any make or model of refrigerator, check first and see if there isn't a Ranco control that is **exactly** what you need. Bulletin showing complete line of replacements yours on request.

RANCO, Inc., Columbus, Ohio.

Air Conditioning Made Easy — By J. O. Jordan

Selecting Equipment for Indirect Air-Conditioning Systems

SECTION NO. 20 (Part 2)
Selecting Equipment

The Indirect System

The Air Conditioning Unit

The methods of procedure for selecting the air-conditioning unit using cold water is similar to the methods described above for direct expansion units, except that the water flow rate is an additional factor which may be varied to obtain the desired performance characteristics.

The economical water flow per ton of refrigerating capacity is limited on the one side by pumping costs and on the other side by coil costs, for if the water rate per ton is too high, pumping costs become excessive, while if the water rate is too low, then coils of excessive size must be used in order to obtain the required coil capacity.

Generally, the practical flow rate is from 3 g.p.m. per ton to 4 g.p.m. per ton, or a water temperature rise of 8° or 6° respectively. Lower rates of flow than 3 g.p.m. per ton or a greater temperature rise than 8° result in higher average water temperature within the coil, so that coil temperatures and capacities suffer. The saving in coil costs due to increase in capacity resulting from rates of flow higher than 4 g.p.m. per ton generally is offset by increases in pumping costs.

Even with the proper rate of water flow in g.p.m. per ton, performance will not be good unless the water is circulated through the tubes at the proper velocity, for low velocities penalize coil capacity because of the reduced transmission factor at low velocities, while high velocities increase pumping costs because of the excessive friction at high velocities. At velocities above 250 f.p.m. there is very little increase in the transmission factor, while there is little decrease in the factor at velocities ranging down to 180 f.p.m. However, at lower velocities, the factor falls off rapidly. Therefore, the water velocities through the tubes of the coil should range between 180 f.p.m. and 250 f.p.m.

Having selected the water flow rate in g.p.m. per ton, the water velocity may be regulated as desired by selection of tube sizes and by proper arrangement of headers and connections, remembering that smaller tubes and/or fewer parallel water paths or circuits result in higher water velocities, while larger tubes and/or more circuits result in lower water velocities.

The proper depths of the chilled water coil in direction of airflow for various latent-to-total load ratios are as given above under the selection of direct expansion equipment.

Like the direct expansion coil, the temperature of the chilled water coil also must be determined by the latent-to-total load ratio, lower coil temperatures being required for higher latent-to-total load ratios. Since the water-flow in g.p.m. per ton determines the temperature rise of the water within the coil, the quantity of flow as well as the entering water temperature govern the temperature of the coil.

For this reason, both the rate of water flow and inlet water temperature may be varied to fix the latent-to-total capacity ratio as desired, remembering that water temperatures below 40° are impracticable to obtain.

The methods of procedure in selecting the air-conditioning unit for chilled water circulation are identical with the methods described above for similar direct expansion air-conditioning units, except that water temperatures and flows are used rather than refrigerant temperatures and suction pressures.

Having selected the air-conditioning equipment and its water requirements, the total quantity of water and the range through which it is to be cooled is known.

The Water Cooler & Condensing Unit:

This equipment is selected from the tables so that the capacity is equal to the total capacity of the air-conditioning units which are to be served, plus line losses.

Having determined the required water flow, the required final water temperature leaving the water cooler, and the temperature at which the water will be supplied to the water cooler, the water cooler may be selected from the proper capacity tables. A condensing unit must be selected where capacity at the refrigerant pressure in the water cooler less suction line losses, is equal to the load upon the water cooler in B.t.u. as read from the water cooler capacity tables. The selection of the condensing unit is made as described above for the condensing unit for the direct expansion system.

Heating and Humidifying Equipment

If the equipment is to be used for year-around air-conditioning service, the heating and humidifying capacities of the air-conditioning unit (which has been selected on the basis of the cooling load) should be checked, so as to make certain that heating capacities are equal to heating loads.

If the heating capacity is 25% greater than the heating load, a by-pass damper should be opened during the heating season, until the capacity approximates the load. If the heating capacity is less than the load, a booster heating coil must be installed at the intake.

Generally, the heating coil for the year-around unit should be selected so that the heating load is carried with the same airflow in c.f.m. through the heating coil that is required for the cooling coil.

The winter-conditioning or heating unit should be selected from the capacity tables so that the heating capacity exceeds the heating load by the necessary safety factor as described under Part 1 of this section, with an air delivery which will result in 5 to 10 air changes per hour within the space to be heated, and with air entering the unit at room temperature, or at the proper air-mixture temperature if a proportion of outside air is to be drawn through the unit.

For steam heating the pounds of steam required per hour may be determined by dividing the capacity by 1,000.

For water heating, the necessary water quantity may be determined by the following equation:

$$\text{G.P.M.} = \frac{\text{B.t.u. capacity per hour}}{500 \times \text{(water temp. drop)}}$$

Selection of Equipment For Humidity Control

Reasons for Humidity Control

If the summer air-conditioning coil has been so selected that its total capacity and its latent-to-total capacity ratio are equal to the total maximum load and the latent-to-total load ratio of the load at the entering air conditions which exist at the desired room conditions, the room humidity will be maintained inherently at the desired level as long as sensible and latent capacities *both are at maximum*. However, a very common load condition is for the sensible load to be considerably below maximum (due to absence of sun effect or to moderate outside dry-bulb temperatures) while the simultaneous latent load is at or near maximum (because of heavy occupancy and ventilating loads).

Under such conditions, the equipment which has been selected to balance maximum load conditions must be held inoperative during a considerable portion of the time, in order to prevent over-cooling of the conditioned space. During the off-cycles of the equipment while no latent work is being done, the humidity level of the room will rise if the latent load is heavy.

As the sensible load becomes lighter and the running time of the equipment becomes shorter, the humidity level of the room rises until ultimately an uncomfortably high humidity level is reached.

Automatic Controls

A common method of remedying this situation is to provide some automatic means of reducing sensible capacity to meet reduced sensible loads without reducing latent capacity (or with increased latent capacity). The result of the reduced sensible capacity is that the equipment is made to operate a greater portion of the time at reduced sensible loads, while the result of the increased running time is that more latent work is done.

As described in Section No. 14, this change in performance generally is obtained by passing a portion of the airflow or a portion of the refrigerant-flow around the coil, and allowing a reduction of refrigerant temperature with a resultant rise in the latent-to-total ratio.

A very important point to remember in selecting equipment involving such types of humidity control is that the sensible and latent capacities, with all by-passes shut so that all the airflow and refrigerant is passing through the coil, must balance the *maximum* sensible and latent loads. Other conditions will then take care of themselves. The automatic humidity control features must be ignored in selecting the equipment, because such features serve only to reduce the sensible capacity to meet reduced sensible loads.

The automatic humidity control does not act for the properly selected coil under maximum load conditions, because sensible and latent capacities balance sensible and latent loads at the desired room temperature, nor can humidity rise under maximum sensible or latent loads if the coil is properly selected. The automatic humidity control can be brought into action only by rise in humidity, which can take place with properly selected equipment only as a result of shortened running time, due to reduced sensible loads coincidental with heavy latent loads.

Under some operating conditions, the by-passing of a portion of the air or the refrigerant around the direct expansion coil actually results in a rise in latent capacity. Under such conditions, sensible capacity will be greatest when the by-pass is closed but latent capacity will be greatest when the by-pass is open.

Sometimes the error is made of selecting such equipment so that sensible capacity with by-pass *closed*

(Continued on Page 15, Column 1)

THE BUYER'S GUIDE

MILLS
COMPRESSORS
for Commercial Use
Mills Novelty Company • 4100 Fullerton Avenue • Chicago, Illinois

"SABECO" METAL
INGOTS, SOLID BARS, CORED BARS, CASTINGS FINISHED TO SPECIFICATIONS
The Certified Bearing Bronze
LEADING MANUFACTURERS
Of refrigerator compressors use "SABECO" metal because this certified bronze is accurately made, exactly machined to specifications, seals perfectly, lasts longer, minimizes seal replacements. Send for details of "SABECO"—a better metal for refrigerant, oil, and water seals.
SEAL RINGS
BUSHINGS
BEARINGS
SEAL NOSES
Fredericksen Company
Saginaw, Michigan

CHIEFTAIN
QUALITY-BUILT COMPRESSORS and CONDENSING UNITS
The CHIEFTAIN line represents precision manufacture and proven service, and is designed for all domestic and light commercial applications.
Sizes range ⅛ to ¾ HP.
Write for prices.
TECUMSEH PRODUCTS CO.
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Learn the Fundamentals Now!
Read 'Air Conditioning Made Easy'

Published on this and the preceding page is a continuation of Section 20 of AIR CONDITIONING MADE EASY, a manual by F. O. Jordan, air-conditioning editor of the NEWS and former head of the air-conditioning development laboratory of the Airtemp division of Chrysler Corp. The book is being published in serial form in the weekly issues of AIR CONDITIONING AND REFRIGERATION NEWS.

AIR CONDITIONING MADE EASY is a manual and textbook on air-conditioning engineering practice. The section continued in this issue "Selecting Equipment"—gives an indication of the wide scope of the book. It is a manual which deals not only with the engineering principles of air-conditioning and field application procedure, but also with the actual design of equipment and even the proper organization of personnel for a company getting into the field.

As such, AIR CONDITIONING MADE EASY should be widely useful to individuals already in the air-conditioning field who want to broaden their knowledge of it, to students who are intending to make air conditioning their career, and to executives of manufacturing or distributing organizations who are contemplating getting into the air-conditioning business.

The following instalments of AIR CONDITIONING MADE EASY have already been published in the NEWS:

What Is Air Conditioning?—Sept. 23.

Section 1, Introduction, and Section 2, Definitions and Simple Thermodynamics—Sept. 30.

Section 3, Coil and Water Cooler Performance—Oct. 7 and 14.

Section 4, Condensing Unit Performance—Oct. 21.

Section 5, Air Movement and Ventilation Requirements—Oct. 28.

Section 6, The Complete Air-Conditioning System for the Cooling Season—Nov. 4, 11, 18, and 25.

Section 7, Heating—Dec. 2, 9, 16, 23, 30, Jan. 6, 13, 20, 27, Feb. 3, 10, 17, 24, March 3, and 10.

Section 10, Don'ts—March 17 and 24.

Section 14, Controls and Zoning—March 31, April 7, 14, and 21.

Section 15, Design of Equipment—April 28, May 5, 12, and 19.

Section 13, Noise Control—May 26 and June 2.

Section 16, Test Data—June 9, 16. 23, 30, July 7, and 14.

Section 20, Field Engineering—July 28, Aug. 4 and 11.

Section 20 (Part 2) Selecting Equipment—Aug. 18 and 25.

Methods of Selecting Humidity Control Equipment for Various Types of Systems

(*Continued from Page 14, Column 5*)

balances the sensible load, and so that latent capacity with by-pass *open* balances the latent load. The operation of equipment which is so selected is as follows under maximum sensible and latent loads:

With the by-pass closed, the room temperature is held constant at the described level for a time because sensible capacity balances load. However, the room humidity rises because latent capacity with by-pass *shut* is short of the latent load. Soon the rise in room humidity opens the by-pass through humidistatic action so that latent capacity is increased to balance the latent load, and sensible capacity is reduced below the sensible load. Therefore room temperature rises. The equipment can do nothing about the matter because the high room humidity will not allow the by-pass to close and so restore sensible capacity.

However, a rise in dry-bulb temperature lowers *relative* humidity, even though there is little rise in actual *absolute* humidity (see any psychrometric chart, or Table No. 14). Thus the rise in room temperature permitted by the shortage in sensible capacity when the by-pass is open eventually will close the by-pass damper. This will restore maximum sensible capacity and so result in reduction in room temperature. On the other hand it will reduce latent capacity and so result in a rise in room humidity.

Obviously the result of such equipment is a badly fluctuating room dry-bulb temperature (although a *relative* humidity record may look O.k.), discomfort, and dissatisfaction.

Therefore, regardless of automatic humidity controls, the coil must be selected according to the appropriate method described above for air-conditioning unit selection; so that, with all air and all refrigerant passing through the coil, and with the highest refrigerant temperature which is to be used, the total capacity and the minimum latent-to-total capacity ratio equal the total load and the latent-to-total load ratio under maximum total load conditions.

Inherent Control

The above methods of selection for equipment with humidity control are for equipment with automatic controls (as described in Section No. 14). Next is explained the method of procedure for selecting equipment for "inherent humidity control" (see Section No. 14) by which inherent characteristics are designed into the equipment that enable it to control humidity without the control of automatic instruments sensitive to humidity.

The Inherent Humidity Control method is merely to give the equipment a surplus in latent capacity sufficient to enable it to cope with maximum latent effect, even when the equipment is operating only a portion of the time due to light sensible loads.

This extra margin in dehumidifying capacity is obtained partly through designing into the air conditioning a surplus latent capacity by means of equipment selection according to Table No. 21, and partly through the reduction in the latent load upon the coil due to the slight rise in humidity which is permissible at light sensible load conditions, as explained above.

Upon projects such as theaters, night clubs, etc., whose load is principally due to their heavy occupancy only, it is obviously impossible to have any considerable decrease in sensible load and at the same time have a heavy latent load remain, for the very simple reason that when the customers (who together with their ventilation requirements, constitute practically the entire load, both sensible and latent) go home, they cannot take their sensible and leave their latent. For this reason, if the equipment is given ample latent capacity, trouble is unlikely upon the majority of such projects, even without automatic latent *control*.

In order to achieve "Inherent Humidity Control," the air-conditioning units should be selected as follows:

1. Compute the loads as described above on "Computing the Load."

2. Determine the "Percent Sensible Reduction Coincidental with Maximum Latent Load," by solving the following equation:

$$[0.90 \times (\text{Transmission plus sunload plus sensible heat of outside air})] \div \text{Entire Sensible Load}$$

3. From Table No. 21, select the percent *increase* in Latent Load and the percent decrease in Sensible Load which accompany the percent Sensible Reduction determined under Item No. 2 above.

4. Determine a new Latent Load by multiplying the Computed Latent Load by the Latent Multiplier, and determine a new Sensible Load by multiplying the Computed Sensible Load by the Sensible Multiplier, as selected under Item No. 3 above.

5. Determine a new Total Load and a new Latent-to-total Load Ratio from the new Latent Load and Sensible Loads determined under Item No. 4.

6. Make the equipment selection upon the basis of the new Total Load and the new Latent-to-total Load Ratio determined under Item No. 5 above.

Upon projects whose inside design dry-bulb temperature is 80° and whose design dewpoint temperature is 60°, the selection of equipment by the method described above will limit the room dewpoint temperature to 63° when the equipment is operated under the control of a thermostat set at 80°.

This dewpoint temperature will exist only at occasional periods when the sensible load is at minimum coincidental with maximum latent load. At lower design dewpoint temperatures, the maximum dewpoint teperatures will be correspondingly lower.

The dewpoint temperature level will be held lower also if operation is so regulated that inside temperatures below 80° are maintained when outside design temperatures are below maximum.

Split Inherent Control

In the case of installations of extremely high latent-to-total ratios, the "split inherent" system (See Section No. 14) may be selected as follows:

With this system, two units are required, an "outside air unit" and a "recirculated air unit."

All outside air is to be passed through the outside air unit, and this unit must have the maximum possible latent-to-total capacity ratio, therefore, the coil should be operated at the lowest practicable refrigerant or chilled water temperature, should be of considerable depth in direction of airflow, and should possess the proper face area for passing all outside air. The outside air unit must be so selected that its *latent* capacity is equivalent to the maximum *latent* load at the *outside* air conditions which exist during the *maximum* latent load period.

The recirculated air coil for the air unit should be operated at a high refrigerant temperature, should be a comparatively shallow coil, and should be of such size that its sensible capacity with entering air at the *room condition* is equal to the difference between the maximum sensible load and the sensible capacity of the *outside* air unit with entering air at the outside condition existing during the *maximum sensible load period*.

The method of selecting the outside air coil and the recirculated air coil as follows:

Outside Air Coil

Entering Air Condition—at the *outside* air condition existing during the *maximum latent load period*.

Refrigerant temperature (direct expansion equipment) 35°.

Water temperature (for indirect equipment) 40° with 6° rise.

Depth in direction of airflow, 12 inches.

Face area—obtain by dividing the required c.f.m. of outside air (see Table No. 13) by 300-500 c.f.m.

Recirculated Air Coil

Entering air condition—room condition.

Refrigerant temperature (direct expansion equipment) 45°.

Water temperature (indirect equipment) 45° with 10° rise.

Depth in direction of airflow, 6 inches.

Face air velocity, 500 f.p.m.

Face area—of such dimensions that sensible capacity (under above operating conditions with air entering at inside design conditions) equals the difference between the maximum sensible load and the sensible capacity of the outside coil, with entering air at the *outside* condition existing during the maximum *sensible* load period.

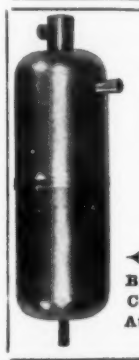
Back Heating

This method of humidity control is described in Section No. 14. Generally it is used on projects of higher latent-to-total ratio than can be obtained with the practicable air-conditioning coil. The usual arrangement is to circulate the air through the air-conditioning coil where the proper quantity of latent work but too much sensible work or cooling is done, because the latent-to-total capacity of the coil is lower than the latent-to-total load ratio.

After being passed through the air-

(*Concluded on Page 16, Column 1*)

THE BUYER'S GUIDE



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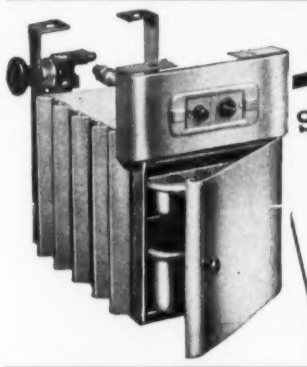

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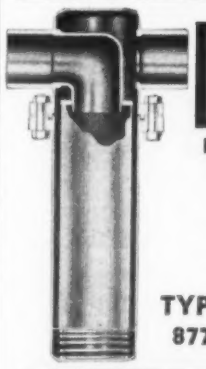

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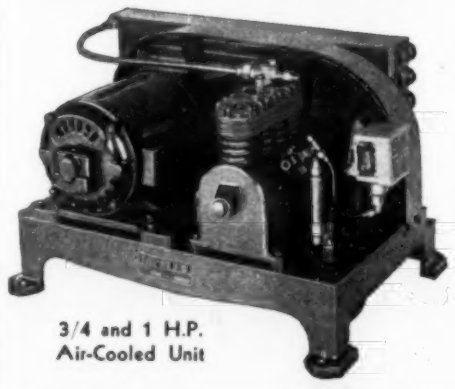

3/4 and 1 H.P. Air-Cooled Unit

Modern Compressor Units for Modern Refrigeration and Air-Conditioning applications are found in Diceler Four Cylinder Units. A compressor for every refrigeration need may be selected from the complete line of models from ¼ hp. to 30 hp.

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DEISSLER MACHINE COMPANY
Greenville, Pa.
Over a sixth of a century in electric refrigeration

Equipment Used in 'Back Heating'

(*Concluded from Page 15, Column 5*)

conditioning coil, the air is circulated through the "back-heating" coil, where it is warmed sufficiently to prevent over-cooling the conditioned space. As the cooling load upon the conditioned space decreases, the amount of back-heating must be increased.

Back heating may be used also upon installations where the latent-to-total load ratio at maximum sensible load is not higher than the latent-to-total capacity ratio, but where the latent-to-total load ratio at reduced sensible load coincidental with maximum latent load is higher than the latent-to-total capacity ratio of the coil.

The method of procedure for selecting the equipment when the latent-to-total load ratio at maximum sensible load is higher than the practicable latent-to-total capacity ratio of the coil, is to select an air-conditioning coil not less than 12 inches deep in direction of airflow, at a refrigerant temperature of 35° (or a water temperature of 40° with a 6° rise) with sufficient face area to obtain a latent capacity equal to the maximum latent load.

Obviously, if the latent-to-total capacity ratio of the coil is lower than the latent-to-total load ratio, the sensible capacity will exceed the sensible load. A back-heating coil must be selected whose maximum heating capacity is equal to the difference between the maximum cooling capacity of the air-conditioning coil and the minimum cooling load which will exist within the conditioned space coincidental with maximum latent load.

Method of procedure for selecting the equipment when the latent-to-total load ratio at the maximum sensible load is *not* higher than the practicable latent-to-total capacity ratio of the coil is as described above with this exception: The air-conditioning coil is selected at a refrigerant or water temperature at which its latent-to-total capacity ratio is equal to the latent-to-total load ratio at maximum sensible load.

The equipment is then arranged so that the back-heating coil is brought into service when the sensible load has decreased to a level at which the latent-to-total load ratio has become higher than the latent-to-total capacity ratio of the coil.

Design Methods and Problems

Design methods as described and problems exemplifying them may be found in Section No. 20-C.

THE BUYER'S GUIDE

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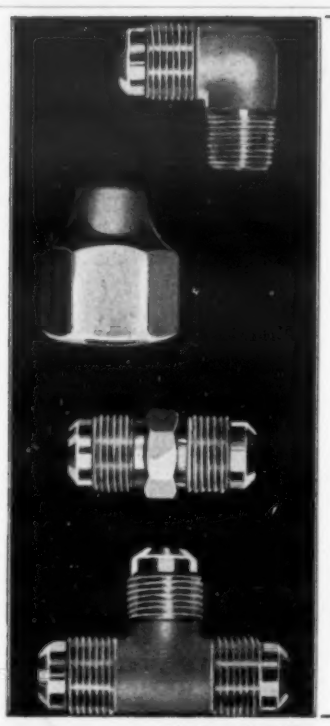

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Every style and size of forged flared tube fitting for the refrigeration industry is available from standard stock at Commonwealth.

Thousands of semi-standard patterns enable us to quickly furnish any desired variation in pipe and tube ends.

Special fittings made to order.

Commonwealth fittings are correctly designed, carefully machined, and tube seats are protected in shipping.

25 years of service to the industry.

COMMONWEALTH BRASS CORPORATION

Commonwealth at Grand Trunk R. R

DETROIT, MICH.

QUESTIONS

Refrigerated Railway Cars

No. 3089 (Engineer, Brazil)—"The writer has the following inquiry from one of his dealers:

"One hundred, more or less, refrigerating equipments, for refrigerating railway cars, transporting milk and fresh meat, space to be cooled from 40 to 50 cubic meters, power to be supplied by axle drive.

"If you know of any firm or firms which could be in position to supply all or part of this equipment, it would be very much appreciated if you could bring this inquiry to their attention."

Answer: The following manufacturers make refrigerated railway cars:

American Car & Foundry Co.
30 Church St., New York City

General Electric Co.
Schenectady, N. Y.

General Refrigeration Sales Co.
Beloit, Wis.

North American Car Corp.
327 LaSalle St., South, Chicago, Ill.

York Ice Machinery Corp.
York, Pa.

Water Cooler Sales

No. 3090 (Dealer, Illinois)—"Will you please advise us if you have any recent publication with compiled data showing the number of electric water coolers of pressure type and other type sold in the larger cities.

"We would like to get some information on monthly or yearly sales if possible."

Answer: The only figures that we have on water cooler sales are those that are published as part of the report of the Commercial Refrigeration Section of the Refrigeration Division of the National Electrical Manufacturers Association. These give the sales by 15 manufacturers to their distributing outlets.

Maurey Pulleys

No. 3091 (Jobber, Kentucky)—"Can you tell us who manufactures Maurey Pulleys?"

Answer: Maurey pulleys are manufactured by the Up-to-Date Machine Works, Inc., Chicago, Ill.

Artificial Foods

No. 3092 (Distributor, Iowa)—"We are wondering if you could send us the name and address of manufacturers of artificial foods to be used in displaying refrigerators."

Answer: Contact the following companies regarding artificial foods:

Roman Art Co., Inc.
2700 Locust Blvd., St. Louis, Mo.

Cincinnati Doll Co.
311 East 12th St., Cincinnati, Ohio

Display Food Co.
223 E. Fourth St., St. Paul, Minn.

'Kilfrost' Distribution

No. 3093 (Manufacturer, Wisconsin)—"We have been asked by American Airlines, Inc., for information on an English preparation called "Kilfrost," which is being used in refrigeration equipment, for preventing the formation of ice. If you have any information on the nature of this product, and who handles it in this country, we would appreciate receipt of same."

Answer: It is our understanding that the English preparation "Kilfrost" is distributed on this continent by B. Trudel & Cie, 304 Place D'Youville, Montreal, Que., Can.

Service Job Forms

No. 3094 (Dealer, Texas)—"Please advise us if you can put us in touch with any printing firm that can supply us with service sheets which are carried as stock items. We want this for our service department."

Answer: We believe you are refering to job sheet forms, by means of which your service men can keep track of time, traveling, material used, etc., for each job.

Harry Drownes of Drownes Refrigeration Service, Inc., 3174 N. Clark St., Chicago, Ill., has prepared a form for this purpose, and you might be able to purchase a stock of such forms from Mr. Drownes.

Air-Conditioning Specifications

No. 3095 (Architect, Texas)—"Do you have copy of the REFRIGERATION NEWS giving specifications of air-conditioning equipment available and if so what is the price? I know that you usually bring out such an issue early in summer. I am not interested in electric refrigerators but in air conditioning only.

"However, if it is impossible to get these specifications separately I would have to buy them together. I am interested in air-conditioning equipment of all types. and I am particularly interested in the small, room-size conditioners.

"Also will you give me the address of the Air Conditioning Manufacturers Association so that I may get in touch with them in the matter of getting price lists."

Answer: Specifications for air-conditioning equipment have not been published for 1937 models, and it is not likely that they will be published this year.

Specifications for all makes of air-conditioning equipment *through* 1936 are available in the 1936 REFRIGERATION AND AIR CONDITIONING SPECIFICATIONS BOOK, which we publish. Price of this book is $3.00 a copy.

Address of the Air Conditioning Manufacturers' Association is the Southern Building, Washington, D. C.

Delivery Trucks & Pads

No. 3096 (Dealer, Maryland)—"As a subscriber of yours, we are taking the liberty of asking you to advise us where and how we can secure the covering, a quilted-like blanket, waterproofed, together with the straps, as well as a little truck, all of which is used in delivering refrigerators."

Answer: The Bearse Mfg. Co., 3815 Cortland St., Chicago, Ill., advertise in the 1937 MASTER CATALOG (the Red Book) a complete line of pads and harnesses for refrigerators.

The International Engineering Co., Dayton, Ohio, and the American Steel Scraper Co., Sidney, Ohio, both make two wheel trucks which are padded and fitted with straps for carrying refrigerators.

Rubber Products Firms

No. 3097 (Dealer, District of Columbia)—"Kindly inform us by return mail the addresses of the following:

American Hard Rubber Co.
Luzerne Rubber Co."

Answer: Address of American Hard Rubber Co. is 11 Mercer St., New York City; and of the Luzerne Rubber Co., is Trenton, N. J.

List of Manufacturers

No. 3098 (Magazine, Illinois)—"We would greatly appreciate it if you could forward us by return mail a list of all firms which have manufactured household electric refrigerators from the beginning of the industry to date.

"In addition to this we would also like to secure a list of firms manufacturing electric household refrigerators in 1937.

"If you do not have the information desired in the first request we may be able to get along with just the names of the important manufacturers in business today.

"Thank you in advance for whatever information you can supply us."

Answer: The 1936 SPECIFICATIONS BOOK not only includes all manufacturers who have been and are in the business of manufacturing household refrigerators, but also has specifications of their models and other complete information. This is a 512-page book and will give you all the information you want.

Recently we have also published a smaller booklet containing all of the specifications of all makes of 1937 household models. Price of these two books is $3.00.

'Therhumiter' Source

No. 3099 (Dealer, California)—"On page 23 of your July 14, 1937 issue, reference was made to a 'Therhumiter' for measuring humidity and temperature.

"This device has been placed on the market by John R. Parsons, consulting physicist, the article states.

"Will you kindly tell the writer where additional information may be obtained in regard to this instrument."

Answer: Further information may be obtained by writing John R. Parsons at 151 E. 19th St., New York City.

Copeland Parts

No. 3100 (Dealer, Pennsylvania)—"About seven years ago we installed three Copeland compressors on which we placed Apex water valves. We must purchase repair parts for these valves and are at a loss to locate the manufacturer. Can you advise us where to obtain replacement parts for these valves?"

Answer: We suggest that you write to Ben Hyatt, National Refrigeration Service Manager, Copeland Refrigeration Corp., 1331 Holden Ave., Detroit, Mich.

Bendix Co. Address

No. 3101 (Dealer, Texas)—"In the August issue of REFRIGERATION NEWS, there is a picture of a washing machine manufactured by Bendix. We would appreciate it very much if you would give us the address of the Bendix Co. along with any additional information you might have pertaining to this washer."

Answer: (See below).

No. 3102 (Dealer, Kansas)—"In issue of Aug. 11 you had some material on a new Bendix electric washing machine.

"Will you please send us the address of this company."

Answer: The address of the Bendix Home Appliances, Inc. is 1301 S. Walnut St., South Bend, Ind.

UP-TO-DATE SPECIFICATIONS DATA

1937 DATA TO BE INCLUDED WITH 512-PAGE BOOK

Material in the Specifications Book was compiled with a view toward making it usable by both the service man and salesman. For the service man, the 512-page book gives information on the kind and quantity of refrigerant, belt size, compressor and motor data, etc. Of interest to salesmen is the list price, cubic-foot capacity, dimensions, shelf area, finish, etc. This information applies to commercial condensing units and air conditioners as well as household electric refrigerators.

A new 64-page booklet giving specifications of principal makes of 1937 Household Electric Refrigerators will be given with all future orders for the 1936 Specifications Book which includes data on all models of all makes of household and commercial refrigeration equipment and air conditioners for all years.

The material is a revision of that which appeared in the March 17 issue of the News plus the tabulation of "convenience" features which appeared in the News issued April 21.

Price $3.00 per copy . . . Send order with remittance to

BUSINESS NEWS PUBLISHING CO., 5229 Cass Ave., Detroit, Mich.

AIR CONDITIONING

Sioux City Dealers Tell Why Sales Are Profitless But Fail to Agree on Remedy

SIOUX CITY, Iowa—General dissatisfaction with profits and sales volumes was the keynote of interviews held with dealers and distributors of air-conditioning equipment here.

Most dealers in central systems considered this year's business somewhat slower than last year's. Only one, D. K. Baxter Co., Delco-Frigidaire distributor in this territory, claimed any substantial increase, saying that its 1937 sales had been "about double" 1936 ones.

"But that doesn't mean we're making any money," insisted Mr. Baxter, head of the firm.

NO PROFITS

One of the city's nine air-conditioning outlets, A. Y. McDonald Mfg. Co. (Norge), had so far completely refused to compete in this conditioning market at all, according to Branch Manager F. M. Dodds.

"There is no profit in this cut-price market," Mr. Dodds insisted. "We're waiting for prices to get where they belong."

Ranged against the general pessimism of those dealing largely in central systems, however, was the vigorous assertion of Karl J. Gaulding, Jr., partner with his father in Gaulding Distributing Co., distributor for Golden Rod water-cooled summer conditioning units, that:

"Our business has increased about three times over last year's, and we never have to cut list prices in order to sell."

The only other direct claim to sticking to list prices was made by E. D. Malone of Malone & Moles, distributor of Carrier equipment in this area.

A DIFFERENT PICTURE

Seemingly inconsistent with the general attitude of local air-conditioning men, however, were figures provided by Sioux City Gas & Electric Co. Referring only to mechanically refrigerated installations made inside the city, these figures showed that air-conditioning equipment of 648½ tons capacity was installed during the first seven months of 1937 as compared to 180 for the whole of 1936.

Not included in these figures, moreover, were a number of non-mechanically cooled systems, largest of these being the 190-ton Cathabar system (well-water cooling and lithium chloride odor removing) installed in Davidson Bros. department store.

Possible explanations for the radical disagreement between these figures and the statements made by interviewees seem to be:

1. Most air-conditioning contractors here cover territory stretching beyond the boundaries of the city, and their statements, based on business throughout the areas covered, do not apply alone to Sioux City.

2. The utility's figures included some rather large installations which had been engineered and partially or wholly equipped by "outside" firms located in such large cities as Chicago and New York.

Asking what factors were to blame for the general dissatisfaction here was rather like collecting opinions on what is wrong with the government or the younger generation—there were many answers.

Variously blamed were the following: the waste of engineering jobs which were finally let to other bidders, the incompetency and/or dishonest and prospect-misleading tactics of competitors, the tendency of many buyers to invest engineers and contractors from other large cities with imaginary prestige, and the comparatively cool summer.

EDUCATION NEEDED

Everyone agreed, however, on these three causes:

1. Lack of money in this area because of last year's crop losses.
2. Price-cutting practices.
3. Misunderstanding on the part of the general public as to what constitutes true air conditioning and what it costs. All asserted that "the public needs to be educated."

With regard to residential installations, the majority opinion was that, though the possibility of reducing the cost of complete year-around air conditioning in the near future was improbable, it was nevertheless too high-priced to be other than a too-expensive luxury for the average home owner in this latitude.

INDUSTRIES CRIPPLED

Chief crop in this territory is corn, it was explained, and last year it failed almost completely. And the importance of the corn crop to this area is largely in its relation to meat production and processing.

Corn is worth most when turned into meat by stock feeding. No corn meant drastic reduction of meat supply. Result: three of Sioux City's largest enterprises, the Armour, Cudahy, and Swift packing houses had to run on a radically reduced scale during past months.

Though the other two generally-agreed-upon causes—price cutting and the ignorance of the public—seemed to be faults that could be corrected by sufficient dealer cooperation, little immediate hope for such cooperation was probable.

An Air Conditioning Bureau is already in existence, but thus far no reforms in trade practices have been brought about. Chairman of the organization is J. O. Harvey, commercial sales engineer of the Baxter distributorship. W. J. Dougherty, head of the house heating department of Sioux City Gas & Electric Co., is secretary.

COOPERATION LACKING

According to Mr. Dougherty, "Local air-conditioning men, though they've been able to cooperate fairly well on the heating end of air conditioning, haven't been able to get anywhere on the subject of cooling."

Others, commenting on the lack of cooperation, suggested that the industry is too young yet, still too much in the experimental stage—equipment being so far from standardized.

One of the first difficulties to come up, should a public education program be agreed upon, would hinge around **what** the public should be taught. The bitter disagreement now existing between certain local firms and engineers regarding the respective merits of mechanically refrigerated and water-cooled air conditioning would become more acute than ever.

Saving the waste of multiple engineering by having consulting engineers make specifications on which all bids would be based appealed to some dealers, not to others.

"Some sort of consulting engineer setup might work all right," said J. A. Raven, air-conditioning engineer and salesman for Electric Engineering Co., dealer in Westinghouse equipment, "providing specifications could be made in such a way that everyone would have a fair chance to bid.

"But when an engineer starts specifying compressor sizes, the kind of refrigerant to be used, and pieces of special equipment instead of sticking to the results that the customer wants, that engineer can practically force the use on any job of any brand of equipment."

Sioux City Gas & Electric Co., it was said, had offered to provide the consulting engineers, and according to George Macfarlane, owner of Macfarlane Warming & Ventilating Co. (Herman Nelson equipment), general acceptance of the offer by local dealers would have solved this knotty problem. He said that, since the utility was interested in building power load only, no contractor would be more favored than another.

ACTIVE FIRMS PENALIZED

Among those definitely opposed to the use of consulting engineers was D. K. Baxter. His argument was that letting everybody bid on every job would rob the more active firms of the advantage of going out and rounding up customers.

"The ones such a plan would help most," he said, "are the small dealers without salesmen, capital, or reputation who are too lazy to work up their own business.

"And the rest of us would be at the mercy of these hole-in-a-wall dealers. They would sit around and try to underbid us on every job that came up just to see if they coudn't get it at any price that would give them a gambler's chance at a little rakeoff."

Very noticeable in Sioux City was the wide variation in operative methods among air-conditioning contractors. Markups on sublet installation work, for example, ran from 25% down to nothing at all. Minimum down payments on financed jobs had an equal range. Some salesmen did their own engineering.

Most outlets offered one year free service, others none. Newspaper advertising was both the "best" method of promotion and the "worst," depending on whom the question was put to.

Silver lining in the air-conditioning business in this territory is that, up to the time of the interview at least, no legal restrictions on the use of city water for cooling or of sewers for its disposal seem to be in force.

And bright prospects for a good crop in this section this year induced Mr. Baxter to prophesy that the industry would pick up this fall and continue to flourish through next spring and summer.

Problems of the Air-Conditioning Dealer

What can the air-conditioning dealer do individually and cooperatively to improve his chances of making a fair profit? That's the question of paramount interest now to both the dealer and the manufacturer in the air-conditioning business.

Sioux City, Iowa has been an active market for air conditioning, but a series of interviews by a field correspondent reveals that dealers view their situation as far from satisfactory. The nature of some of their problems are and some of the suggested remedies are told in the accompanying story.

In the very near future AIR CONDITIONING AND REFRIGERATION NEWS plans to present a series of interviews with dealers *who are achieving a profit-making success in the air-conditioning business.* These stories will tell what such dealers do to assure themselves that the installations they make will return them a profit.

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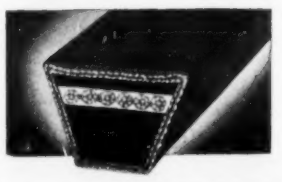

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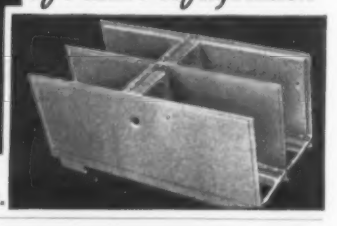

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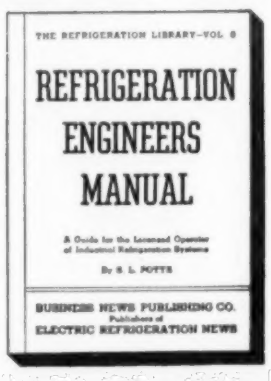
It begins with the principles and methods of refrigeration, discusses refrigerants, deals in detail with the component parts of a refrigeration system, considers the operation of compression and absorption systems, discusses indirect expansion systems, gives data on the manufacture of artificial ice, and discusses in detail cooling towers and spray ponds.

There are 29 tables in the book which supply a ready reference source for the plant operator. The book contains more than 110 illustrations of parts, hook-ups, and uses.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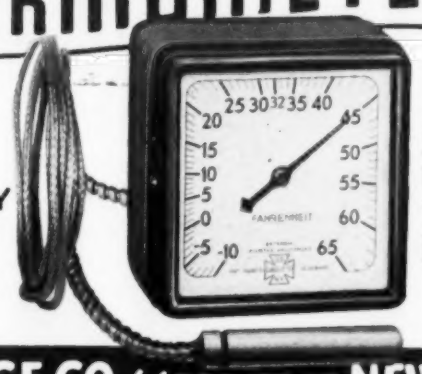

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Basis for Figuring Season Cost Of Cooling System Given by Kansas City Utility Engineer

"How much power will an air-conditioning system use?" is a question heard frequently by air-conditioning salesmen. An answer is given in the study prepared by Anson D. Marston, air-conditioning engineer for the Kansas City Power & Light Co. Mr. Marston read his report before the last semi-annual meeting of the American Society of Heating and Ventilating Engineers at Swampscott, Mass.

A satisfactory answer to the universal question regarding the operating cost of air conditioning is of particular interest to the air-conditioning industry, because frequently the sale depends upon the answer.

It is a simple matter to tell how much operation will cost *per hour of operation,* and even to state the approximate *length* of the operating season. However, the cost per season which the prospect wonders about is another matter, because the seasonal cost is determined by the cost per hour, by the length of the season, by the weather intensity of the season, by the user's disposition, and by any number of other vague and indeterminate factors.

ELIMINATING GUESSWORK

The paper by Mr. Marston attempts to take the guesswork out of the answer by establishing a definite basis upon which operating cost of air conditioning depends, comparable to the "degree day" basis already established in and employed by the heating industry for estimating seasonal heating costs.

In heating, the degree day is defined as "days times the difference between 65° F. and the average outside temperature when the average temperature is below 65° F."

If the average outside temperature during a 24-hour day is 55° F., there are 10 degree days in that day (1 x [65°-55°]). If a month has 30 days and an average outside temperature of 25° F., there are 1,200 degree days in that month (30 x [65°-25°]).

The "baseline" of 65° F. has been selected because the average of a great many records show that no fuel is used for heating in the United States when outside temperatures are 65° F. or above. For the residence or hotel, the actual baseline is slightly above 65° F., while it is slightly lower for factories and sales rooms. However, the value of 65° is accepted by the heating industry as being close enough for their needs.

VALUE OF DEGREE DAY

The value of the degree day lies in the proven fact that for a given type of occupancy and system, heating costs are exactly proportional to the number of degree days. Therefore, the cost of heating during a month of 1,000 degree days will be double the cost of heating the same building during a 500 degree day month.

All that is necessary to obtain a very close estimate of the cost for a season of heating a given building, is to multiply the number of degree days per season for the locality by the volume of heated space in the building or by the square feet of equivalent direct radiation in the building, and then to multiply the product by the proper factor depending upon the type of building and occupancy, and upon the efficiency of the system.

SUMMER BASELINE

In a "nutshell," the paper by Mr. Marston regarding seasonal power consumption of air conditioning is an attempt to apply an inverted version of the heating industry's degree day to summer air conditioning, and to establish a suitable baseline for summer air-conditioning degree day.

Obviously, the degree day for the cooling season must be the reverse of winter's degree day, so that the summer degree day is days multiplied by average degrees **above** the baseline. A surprising fact about the paper is the claim that the records have established the **same baseline for the cooling as for the heating season,** namely, 65° F.

RATE STUDY

"Beginning in 1933," said Mr. Marston, "Kansas City Power & Light Co. offered to its customers an optional rate for power used by strictly air-conditioning equipment. This rate involves the use of a separate meter to measure the power used by such equipment. Furthermore (this is an optional rate) wherever any other rate is more economical, the consumption for cooling purposes is billed on the other rate.

"Of special importance in this study is the fact that this rate calls for customers to be disconnected on Oct. 15 of each year and reconnected on May 1 of the following year. Consequently, fans and other equipment, which are to be used during the winter, are usually served under one of the other rate schedules.

"During the period from 1934 to 1936 inclusive, a total of 72 customers operated under this rate for periods long enough to be of value in this study. Many of these furnish records covering a part only of this period. However, enough information is available for each of these three years to serve as a basis for close study of the relationship between power consumption and weather.

"In the 1932 proceedings of the National District Heating Association there is reported a study of the steam consumption of 163 buildings. These were divided into 20 classes, depending upon usage, and the base temperature corresponding to zero steam consumption was determined for each class.

"These base temperatures vary from 61.2° F. for auto sales and service buildings to 68.8° F. for apartments. The average is 66.0° F. for all buildings. However, in spite of this variation, it is found in practice to be satisfactory to use the 65° F. base for all classes of buildings.

HEAT-POWER RATIO

"Similar investigations were made using the summer energy consumption data which show the relation existing between average monthly temperatures and the average energy consumption for all classes of customers.

"Customers whose load is primarily determined by weather conditions—residences for example—have base temperatures above 65° F., while customers having a large proportion of their load independent of weather conditions generally have base temperatures below 65° F.

"When this study was started, it was expected that the base temperature would be between 70° and 75° F. When an indicated base of 65° F. was found, it was felt that additional studies should be undertaken as a verification.

65° BASE IN SUMMER

"A study of these results will show two things. First, that the variation in energy consumption follows closely the variation in **degree days above 65° F.**

"In the second place, these (results) indicate quite clearly that **degree days above 65° F.** give much closer agreement than do degree days calculated from other base temperatures. As an additional check, similar curves were drawn to a large scale and the degree days for intermediate temperature bases were included. These additional curves verify the use of 65° F. as a base.

"The important factor of relative humidity has been neglected entirely in the above investigations. Before proceeding with the use of 65° F. as base, it was considered necessary to investigate the effect of relative humidity."—(These investigations)—"indicate the absence of any well-defined relationship between relative humidity and energy consumption."

DEGREE DAYS VERSUS ENERGY CONSUMPTION

In his paper, Mr. Marston described extensive tests and their results, relative to the relationship between degree days and current consumption. In this connection, the speaker said:

"From these figures it appears that degree days above 70° F. give better results when residential consumers only are considered," but that "where commercial customers only are considered, values for degree days above 65° F. can be used with assurance.

EFFECT OF HOURS OF OPERATION

"In an effort to arrive at values which take into account the class of operation or the hours of operation," explained the speaker, "the average number of kilowatt hours per horsepower consumed during 1936 by those customers operating 720 hours a month (24 hours a day) was calculated and shown as one point. Similar points are shown for other classes of operation.

"Through the points determined in this manner was drawn a line showing for 1936 the relationship between hours of operation and annual energy consumption. A similar line was drawn for 1935. Then these two were adjusted to a normal year in accordance with variations from the normal number of **degree days above 65° F.**

"Table 1 lists in tabular form the points on this line. With this table it is possible to estimate with reasonable accuracy the total annual consumption which any given commercial customer should experience in a normal year.

"In using Table 1, it is important to bear in mind the fact that it is based upon the assumption that the cooling plant has been correctly designed. Naturally any deviation from accepted design standards will affect the energy consumption.

How Much Power Will a Cooling System Use?

Many times an air-conditioning contractor is pressed to give some fairly precise estimate of the amount of power that will be used by the air-conditioning system which he proposes to install for the prospect.

Anson D. Marston, air-conditioning engineer for the Kansas City Power & Light Co., has developed a basis for making estimates of the total annual power consumption for any given system in a normal year.

Table 1—Energy Consumption vs. Hours Open Per Month

BASED ON NORMAL YEAR KANSAS CITY, MO.

Hours Open Per Month	Kwh. Per Hp. Per Year	Hours Actual Operation Per Year (1 Hp.—0.9 Kw.)
720	1,200	1,332
660	1,120	1,120
600	1,050	1,165
540	975	1,083
480	895	994
420	820	911
360	745	828
300	670	744
240	590	656
200	540	600

"Mention should be made again of the fact that these data cover the operation of equipment which is used only for summer cooling. No attempt was made to include the operation of fans which are used for year-around air conditioning, although a number of fans used in the summer months is included.

"Several of the installations studied have evaporative condensers or cooling towers connected on the same meter as the compressor. Where this was done, it appears that the energy consumption per horsepower for such equipment was substantially the same as that for the balance of the load.

"As an example of the use of the information gathered in this investigation, assume that the proprietor

(Concluded on Page 19, Column 1)

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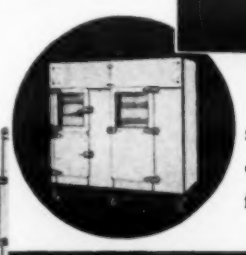

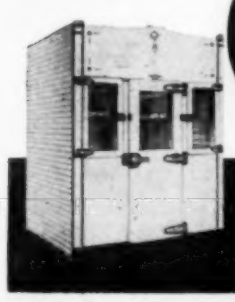

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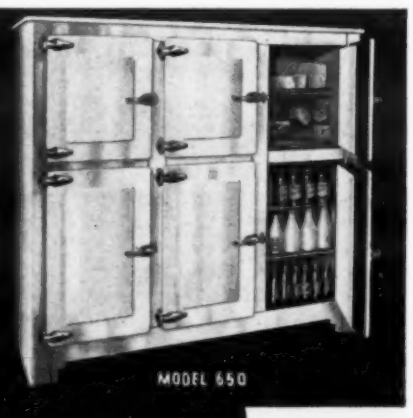

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Marston Calls for More Research on Summer Degree Day

(*Concluded from Page 18, Column 5*)

of a restaurant operating 300 hours per month desires to know the approximate energy consumption of a 20-hp. installation which will be used during summer months only.

From Table 1, it is noted that the total energy consumption should be 20 hp. x 670 kwhr. or 13,400 kwhr. It is noted that this should be distributed through the year as follows:

May	7.4% x 13,400	990 kwh.
June	19.9% x 13,400	2,665 kwh.
July	29.2% x 13,400	3,915 kwh.
August	26.1% x 13,400	3,500 kwh.
September	14.1% x 13,400	1,890 kwh.
October	3.3% x 13,400	440 kwh.
Total		**13,400 kwh.**

"In conclusion it is felt that the investigation described previously indicates the existence of a close relationship between the energy consumption of summer cooling installations and the **degree days above 65° F.,**" declared Mr. Marston. "There are some indications that **degree days above 70° F.** furnish a better basis for estimates of energy consumption for residences, but these are not conclusive. It is realized that the information set forth herein applies only to Kansas City, Mo.

"The officials of the Kansas City office of the U. S. Weather Bureau have shown a fine cooperative spirit and have indicated their willingness to publish values on **degree days above 65° F.** as soon as there is sufficient justification for using this particular temperature. The Washington, D. C. office of the U. S. Weather Bureau has adopted the policy that widespread publication of such values must wait until all investigative studies have been completed and agreement obtained.

"Before this relationship can be considered sufficiently established to justify widespread use, additional studies must be undertaken in other parts of the country. In view of the many uses to which this relationship can be applied when once established, it appears that these additional studies should be undertaken without delay.

"Electric utilities, manufacturers and their distributors, and consulting engineers have all shown an intense interest in the results obtained to date.

"In the Kansas City area they are already using them in preparing estimates of operating cost."

G-E Winter Systems Featured in 26 New Washington Homes

WASHINGTON, D. C.—Gas-fired winter air conditioning by General Electric equipment features each of 26 new "integrated dwellings" recently erected by Modern Housing of Washington, Inc., at Hilltop Sligo Park Village near Silver Springs, Md., a Washington suburb.

All integral parts of these so-called integrated dwellings are said to have been designed and selected for their places after the example set by mass production methods before construction began.

The dwellings are of Cape Cod design, ranging in size from four rooms and bath to seven rooms and two baths, and in price from $6,500 to $9,950. A one-car garage is included in each home.

Although the houses are similar in design, a certain effect of dissimilarity in appearance is obtained by different spacing and facing of the houses upon lots of varying sizes to fit the contour of the land.

Interiors include large living rooms with wood-burning fireplaces, laundry equipment and cork floors in kitchens. All houses are insulated, weather-stripped, and provided with reflective metals for the purpose of reducing heat transmission.

The General Electric air-conditioning equipment consists of a single unit, employing gas for fuel, which in winter heats the houses with filtered, humidified air, supplying automatic control throughout the heating season. In summer it circulates and filters the air, eliminating dust. Both heat and domestic hot water supply are automatically controlled.

The organization which designed and built the houses has been developing the idea of integrated dwellings for the last three years, and at a cost of several hundred thousand dollars has worked toward the production of the best possible house regardless of cost. Findings have been checked with prominent authorities in the construction field and all materials used have been thoroughly tested.

All materials and equipment have been tested for adaptability to the whole structure, and building costs have been lowered through standardization, with a staff of builders and architects working together.

Special Problems of Heat Removal Solved In Bureau of Mines Oil Research Building

BARTLESVILLE, Okla.—Recently placed in operation, the air-conditioning system installed in the United States Bureau of Mines building here by Natkin & Co., air-conditioning dealer for Westinghouse, has performed satisfactorily under rather rigorous conditions.

This building is dedicated to and used almost exclusively for research on oil and petroleum products. It is a four-story brick building, approximately 150 feet long by 50 feet wide.

The air-conditioning installation consists of three Westinghouse direct connected 25-hp. compressors, supplying refrigerant to a coil in the air-conditioning housing through which air is passed for summer cooling and dehumidifying and winter heating and humidifying. There is a separate supply and return for every room in the building.

A problem was presented in the balancing of the load and in the design of the system, due to the fact that about 50% of the building is devoted to laboratories where heat units of several different types are installed, necessitating the exhausting of fumes and heat generated during the different experimental processes.

The building is zoned into several complimentary divisions to act for differences and variations in solar radiation. All supply and return ducts were run to the inside walls and covered with 1 inch of vegetable fibre.

The heating is carried out by means of steam boilers connected to the heating coil located in the conditioned housing. This coil is controlled by means of face and by-pass damper.

Engineering Advances Related to Field Men by Carrier

NEWARK—Outstanding engineering developments in the air-conditioning field were outlined by Willis H. Carrier, chairman of the board of Carrier Corp., at a three-day meeting Aug. 2 to 4 of 150 Carrier engineers from all parts of the United States.

Mr. Carrier has since departed on a three-month trip to South Africa, where he will inspect the Carrier air-conditioning installation at the Robinson Deep Mine in Johannesburg.

Among the subjects discussed by Mr. Carrier were the engineering advances in the development of the Carrier centrifugal refrigerating machine and the Carrier evaporative condenser.

L. R. Boulware, general manager and vice president; L. L. Lewis, chief engineer and vice president; Donald French, vice president in charge of research; and other engineering executives also addressed the morning, afternoon and evening sessions of the meeting.

A feature of the meeting was a trip to the Schaefer brewery in Brooklyn, where the engineers inspected the recent 650-ton Carrier centrifugal refrigeration installation. This equipment supplies all the demands of the brewery for refrigeration, and is designed as a part of the whole heat balance system.

L. H. Polderman of Los Angeles, manager of the west coast division of Carrier; E. T. Murphy of Chicago, vice president in charge of the central district; H. P. Gant of Philadelphia, manager of the southeastern division; and R. T. Tree of New York, manager of the northwestern division, were among the engineers attending the conference.

New Ventilation Firm Begins Production

SOUTH BEND, Ind.—South Bend Air Products, Inc., recently organized to take over all of the Bendix Corp. patents on ventilator equipment, began filling orders for industrial ventilator products Aug. 2. Plans are announced for production next spring of home attic and cellar type ventilator systems.

Officers of the new company are: Marshall A. Smith, Jr., president and treasurer; William Pueschel, vice president; J. E. LeJune, secretary.

Mr. Smith was with Bendix eight years, and for ten years served as chief of the propeller branch of the engineering division of the United States army air corps at Wright Field, Dayton.

2 New Cooling Units Using Water Put on Market by Carrier

NEWARK—Carrier Corp. has just issued a sales pamphlet introducing two new air-conditioning units which use cold tap or well water as a cooling medium. One is a floor model, and the other a ceiling model.

The pamphlet, titled "Carrier Air-Conditioning at the Mere Cost of Water," explains that the units perform all the functions of a summer air conditioner—cooling, dehumidifying, and air circulating. Specially arranged coils in the units are cooled by the water, and they in turn cool the air as it passes over. The floor model may be equipped for winter air conditioning also.

Air Conditioning Boosts Drug Store's Trade

MARIETTA, Ohio—Since a 10-ton air-conditioning system was installed in the Gallager Drug store here recently by the Monongahela West Penn Public Service Co., a marked increase in patronage has been apparent, according to the management.

The unit is installed in a penthouse on top of the building, to eliminate the danger of having it exposed to floods.

Water at a temperature of 52°, drawn from a well drilled near the building, is used to cool the air before it passes over the refrigeration coils in this installation. The water pump has a capacity of 35 g.p.m.

Dayton Firm's New Offices To Be Air Conditioned

DAYTON—A year-around air-conditioning system is to be installed in the new office building of the Standard Register Co. here. The Refrigeration Co., Delco-Frigidaire distributor, has been awarded the contract.

Air-conditioning equipment will also be installed to cool the company's present office building. The Austin Co., Cleveland, is general contractor in charge of the construction work.

F-M to Sponsor Month's Training Course

CHICAGO—A practical training course dealing with the problems of selling, installing, and servicing air-conditioning equipment will be sponsored by Fairbanks, Morse & Co. during the month of October at the company's plant in Beloit, Wis.

Graduates of colleges, technical schools, and high schools, who want to fit themselves for work in the air-conditioning field, are eligible to enter the school. There will be no tuition charge.

"The air-conditioning field is opening up so rapidly," said J. W. Bostwick, manager of the air-conditioning division of Fairbanks-Morse, "that the need for trained men exceeds the supply. The air-conditioning business, being highly technical, demands a staff of thoroughly trained men in both the sales and service departments before sales promotional activities can be allowed to move forward at full steam."

Fairbanks-Morse has devised a practical course of study that will enable the candidate for a position in the air-conditioning field to equip himself with the necessary technical information quickly, if he has a reasonably sound background of study in engineering subjects, Mr. Bostwick said.

THE BUYER'S GUIDE

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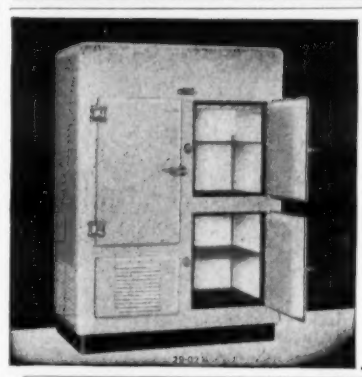

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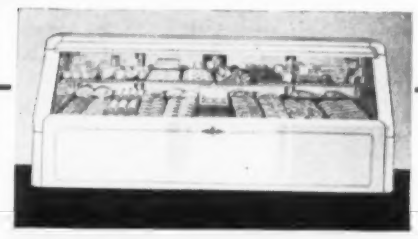

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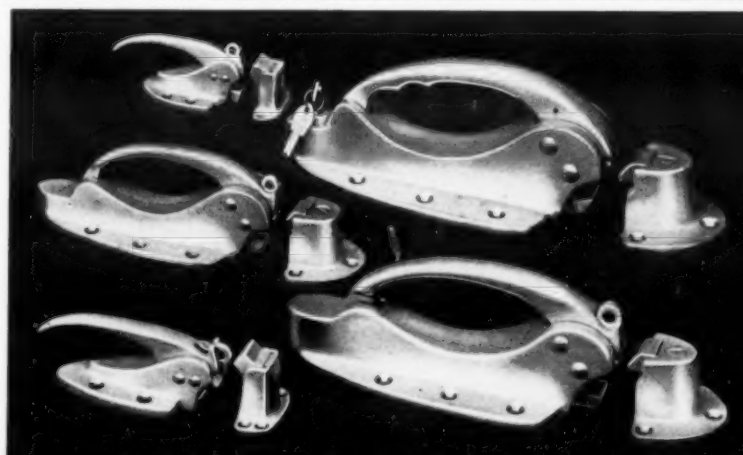

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